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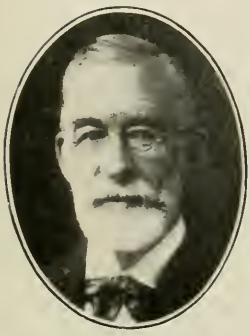

URBAN G. HITCHCOCK

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JOHN O. ROE

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# TRANSACTIONS

OF THE

## Thirty-ninth Annual Meeting

OF THE

# American Laryngological Association

HELD AT

ATLANTIC CITY, N. J.

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MAY 28TH, 29TH AND 30TH, 1917

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## REGISTRATION

The Thirty-ninth Annual Congress of the American Laryngological Association was called to order Monday, May 28th, 1917, at 10 A. M., by the president, Dr. Joseph L. Goodale, in the Reception Room of the Hotel Chelsea, Atlantic City, N. J. The following Fellows enrolled during the session:

Barnhill, John F.
Bryan, Joseph H.
Butler, Ralph
Chappell, Walter F.
Clark, J. Payson
Coffin, Lewis A.
Delavan, D. Bryson
Fetterolf, George
Getchell, Albert C.
Goldstein, Max A.
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Loeb, Hanau W.
Logan, James E.
Lynch, Robert C.
MacCoy, Alexander W.
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Mayer, Emil
McKimmie, Oscar A. M.
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Munger, Carl E.
Myles, Robert C.
Pierce, Norval H.
Rhodes, John Edwin
Richards, George L.
Richardson, Charles W.
Shambaugh, George E.
Shurly, Burt R.
Sluder, Greenfield
Smith, Harmon
Swain, Henry L.
Watson, Arthur W.
Wood, George B.

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TRANSACTIONS OF THE THIRTY-NINTH ANNUAL MEETING

OF THE

# American Laryngological Association

HELD AT

ATLANTIC CITY, N. J., MAY 28TH, 29TH AND 30TH, 1917

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## PRESIDENT'S ADDRESS

JOSEPH L. GOODALE, M.D.

*Fellows of the American Laryngological Association:*

Permit me to express to you my deep appreciation of the honor which you have bestowed upon me. The occupancy of this chair represents not only the realization of the highest aspirations of American laryngologists, but confers also the privilege of entering the distinguished company of those men who have constructed the edifice of American laryngology.

For another reason I thank you for this position, namely, since in virtue of it, I am enabled to state to my predecessors collectively how much for the past twenty years I have grown to realize our indebtedness to them for all that makes the atmosphere of our meetings, for the contagious enthusiasm, the imagination and optimism of their scientific work in association with the never-failing spirit of fine comradeship. In the expression of these sentiments I am sure that you heartily concur.

During the past year the Association has lost four of its most valued active members.

Dr. Hartman, a member since 1878, one of the staunchest supporters of the Association, will be greatly missed by all whose privilege it was to know him. In his long and pro-

ductive career he established for himself a high place both in our scientific annals and in our affectionate esteem.

In Dr. Kyle's untimely death we feel keenly the loss of a fine comrade and a student of science. Through his patient and careful investigations, a new field was opened up in the study of the salivary secretions, not only in itself of great importance but also one bearing upon many other disturbances of the human body. Elected to this Association in 1898, he rarely missed a meeting. To the last minute of his busy and useful life, he was an indefatigable worker, radiating a boundless energy and the spirit of warmhearted friendship.

Dr. Casselberry's loss is deeply deplored by the Association. No meeting seemed complete without his infectious laugh and striking presence, while his contributions to laryngology represent a large amount of solid achievement of permanent value.

It is with genuine sadness that I must speak of the death of our president of last year, Dr. Makuen, an indefatigable worker, both in general laryngology, and in the difficult field of speech defects, in which he was easily leader. We have lost not only a fellow member who upheld faithfully the best traditions of our society, but also one who was a very real friend to all who knew him.

In previous years it has been the custom for the presidential address to consider matters in retrospect, either those of a scientific nature, or those pertaining to the past history of this association. This year we meet at a time when the thoughts of all are centered upon our entrance into the great war. You will, therefore, I am sure, permit me to present certain reflections concerning the relations of our association to the existing situation.

In regard first to our immediate contribution to national service, I will say that in accordance with the request of the Council of National Defense, I have appointed three of our members to serve upon the Advisory Medical Board. After consultation with the President of the Otological Society, and the President of the Laryngological, Rhinological and Otological Society, appointment was made of Dr. Chas. W.

Richardson, Dr. Burt R. Shurly, and Dr. H. P. Mosher, who are members of the three Societies. The report of this Committee will be presented on the last day of our Session, in conjunction with the Otological Society.

Without anticipating the report in question, it may be of interest for us to consider in what way those of us who are called into active service may find an opportunity for the exercise of their specialty. An examination of current medical war literature yields a variety of observations, which concern us very directly, and which show how our training and experience may aid in solving some of the new problems which have arisen.

Aside from the fact that lesions of the upper air passages are especially frequent in the present war, both from the character of the missiles and from the use of asphyxiating gases, observers have noted a great increase in inflammations of the nose and throat spread by contagion among the numerous masses of men in modern trenches.

The contributory causes are the prolonged stay in the trenches, the dampness and want of ventilation in the dugouts, together with the defective light, in which the virulence of microorganisms is increased, or at least the bactericidal influence of sunlight and fresh air is absent. These conditions appear to favor not only the spread of acute catarrhal infections, but also of cerebrospinal meningitis. The importance of stamping out foci of this latter disease, has suggested the desirability of examining recruits with reference to the possibility of their being carriers through lodgment of the meningococcus on the mucous membranes of their nasopharynges. Disinfection of the mucous membrane of carriers has been successfully accomplished by placing the individual in a chamber containing a certain percentage of chloramine vapor for a few minutes. The proceedure is said to cause but slight irritation to the mucous membranes, but seems to have almost a selective action on the microorganisms in question.

Some sections of the line appear to be especially unhygienic and numerous cases occur of infection which in ordinary life are rare, such as perichondritis of the larynx and primary

laryngeal tuberculosis. Latent systemic disease is prone to be lighted up, such as tuberculosis and syphilis. Bleeding from the nose, trachea and bronchi, at times of an alarming extent, often occur. In albumnuria, fatigue and cold are apt to bring on glomerulo-nephritis, a not infrequent symptom of which is edema of the glottis. The unfavorable influences are increased by the difficulty of changing clothing, transportation in open vehicles, and by rapid changes of temperature.

Direct laryngoscopy has proved its value in locating traumatic lesions.

An examination of current medical reports is sufficient to impress one with the advantage accruing to the physician from a previous training in laryngology and its allied specialties.

The second matter of which I wish to speak, although not laryngological in nature, nevertheless concerns us directly in so far as we have an influence in determining the course to be pursued by teachers and investigators both at the present time and in the future. We have recently welcomed the British and French Commissions, whose primary object was to give our administrators the benefit of their own painfully acquired experience. May we not also profit by an examination of the writings of those who are now endeavoring to indicate some of the errors of judgment and conduct in matters of education and research?

As Dimnet pointed out in the case of France, there was prior to 1911 a material weakening of the nation's force, and an outward deterioration of the national spirit, only recoverable in the face of a national crisis, which was furnished by the events of that year. In England it is evident that among the striking effects occasioned by the present crisis has been a vast amount of self-criticism and revaluation of present educational standards and methods. While conditions of public life in America are essentially different, yet in the main the conclusions of the English writers are applicable to us. Summarizing these briefly, we find especial emphasis is laid upon the importance of developing science in general education. In May, 1916, a Committee on the Neglect of Science

presented to the Government resolutions to the effect that it is a matter of national urgency that the Natural Sciences should be made an integral part of the educational course in all the great schools, and that it is desirable that the government should encourage the study of natural sciences by assigning capital importance to them in competitive examinations for the home and Indian service; also require some knowledge of natural sciences from all candidates for admission to Sandhurst.

In illustration of past deficiencies in this respect may be cited the fact that for many months the English authorities, while rigorously excluding from Germany such articles as saltpeter and cotton, nevertheless were permitting the exportation of lard from this country in large quantities in ignorance (I am quoting from the British Medical Journal) that it is the source of glycerine, and consequently a prime requisite in the manufacture of explosives. A few weeks ago I saw a copy of a wireless message intercepted in Cambridge in December 1915, at the physical laboratory and sent from Nauen in Germany to Armour & Co. calling for several hundred cases of lard to be delivered at a port in Denmark.

While the application of this story may seem at first beside the mark for our association, yet we may, on looking more deeply, recognize that as nations court destruction for want of science, so our profession in America runs the risk of being outstripped by that of other countries unless it rests upon an equally secure foundation of scientific training with all that this implies.

Another matter which I wish to present for your consideration has been suggested to me by the experience noted now and freely discussed by British observers, namely the slackening up of scientific work in that country in the early part of the war. Such a retardation in the intellectual activity of a nation overwhelmed by the sudden realization of impending peril is not surprising, but now after nearly three years of war, it is openly regretted that more definite efforts were not made to carry on in England such phases of scientific and educational work, as were not incompatable with a whole-

hearted devotion to the interests of the nation. In a recent address in Boston by S. K. Ratcliffe of Manchester, England, attention was directed to the much better maintenance of work in Germany in these respects, as compared with England. The appreciation of this now generally recognized observation to our own circumstances at the beginning of our participation in the conflict, deserves your careful consideration. We should, however, differentiate between those educators and investigators on the one hand, whose position permits an advantageous deflection of their activities into channels capable of rendering a direct national service, and on the other those individuals who by reason of their age, lack of physical qualifications, or from the nature of their work, may regretfully feel that they must stand aside without a definite service to offer. Recently a dermatologist who has in the past contributed as much as any man to the advancement of his specialty said to me, "What can I do at the present time?"

It seems to me, however, that such men are capable of making a very real contribution to the nation. It is for them to uphold the best traditions of their past, to maintain without faltering their customary work of teaching and investigating, and to present to their comrades whose good fortune it may have been to participate more directly in military service, on the return of peace a definite record of having kept undimmed each in his own chosen field the light of education and of research. The program which is before you is gratifying evidence of the spirit of this Association in the present. May we not hope that the ensuing year will show an even greater record of work accomplished?

I now declare the Thirty-ninth Annual Congress of the American Laryngological Association open and ready for business in accordance with the official program.

# RADIUM IN THE TREATMENT OF GROWTHS OF THE UPPER AIR PASSAGES

D. BRYSON DELAVAN, M.D.

The problems offered in the scientific study and application of radium are many and complex. For its successful use, therefore, wide experience combined with a high degree of intelligence and skill are essential. At the Memorial Hospital, New York City, an institution devoted to the study of cancer, extensive and carefully conducted investigations of the effect of radium upon carcinoma and numerous other forms of new growth have been carried on during the past three years, under the supervision of Dr. H. H. Janeway, Physician in Chief of the Radium Department, of the Medical Department of Cornell University, with the aid of Prof. James Ewing, Pathologist, and of Mr. Fialla, Physicist.

The Memorial Hospital possesses three (3) grains of radium metal. The number of patients treated has been considerable, the work has been carefully studied and has been carried on with the greatest possible effort towards scientific accuracy. The case records have been compiled with minute care as to the full and complete details of every feature that might prove of value. Especial pains have been taken in the description of the methods employed for the application of the radium itself, the strength of the dosage, time of exposure, and all other necessary data. The cases treated represent practically all of the important organs of the human body. A full report of this work is about to be published of which it may be said that no other so complete report has yet appeared either in this country or abroad*. Of this it is my privilege to give herewith a brief summary of that section of it which relates to the Department of Carcinoma of the Upper

* The report may be had of the publisher, Paul M. Hueber, 69 East 59th Street, New York, or on application to the Memorial Hospital.

Air Passages. All told, 422 cases were treated. Of these, 184 were of the upper air passages.

In preparing the report no attempt has been made to exclude the more unfavorable cases. Practically all applying have been treated, in part, for the purpose of testing how far radium can be of palliative benefit. But even with the ear-

| Location | Believed to Have Completely Retrogressed | Well One Year Since Treatment Began | Improved | Still Under Treatment | Prophylactic | Unimproved | Total |
|---|---|---|---|---|---|---|---|
| Lip | 6 | 4 | 6 | 1 | | 12 | 24 |
| Nose | | | 1 | | | 2 | 3 |
| Superior Maxilla | 4 | 2 | 11 | 2 | 1 | 9 | 25 |
| Cheek | 4 | 2 | 3 | 3 | 1 | 3 | 11 |
| Inferior Maxilla | | | 6 | 4 | | 6 | 12 |
| Floor of Mouth | | | 4 | 3 | 1 | 1 | 6 |
| Tonsil | 5 | 2 | 15 | 7 | | 6 | 26 |
| Tongue | 2 | 2 | 24 | 2 | | 24 | 50 |
| Larynx | 1 | | 10 | | | 16 | 27 |
| Total | 22 | 12 | 80 | 22 | 3 | 79 | 184 |
| | 12% | 6.5% | 43% (55%) | 12% | | 43% | |
| Esophagus | 1 | 1 | 6 | 1 | | 15 | 22 |
| Stomach | | | 4 | 4 | | 3 | 7 |
| Rectum | 3 | 1 | 13 | 3 | | 18 | 34 |
| Total | 4 | 2 | 23 | 8 | | 36 | 34 |
| Total | 26 | 14 | 103 | 30 | 3 | 115 | 247 |

lier and more promising cases, many of the results are less successful than would now be obtained with the improved methods in use at the present time.

Turning to the collection of cases described in the report, we will consider the results of the treatment of which such complete details are given in the report itself, proceeding to an analysis of the different case groups.

The value of radium in the treatment of surface epithelioma has been maintained by all investigators and is unquestionable. Interesting and important as this is, the possibility of the successful treatment of cancer of the mucous membranes is of far greater importance. Thus the study of its effect upon new growths of the air passages,—of which epidermoid carcinoma is the most frequent and the most dangerous,—becomes essential. As bearing upon the same principles of pathology and repair, the experience gained in the treatment of the epidermoid carcinomas of the esophagus and anus and of the adeno-carcinomas of the stomach and rectum is valuable to us in the study of the treatment of the same conditions in the mouth, nose and throat.

*Carcinoma of the Lip*

Of 25 cases, there was complete retrogression in six. In all but two of these, the growth was in the early stage. In two it was rather advanced but without metastasis. This fact is important, in that it emphasizes the desirability of treating all patients in this early stage by radium, since, as is well known, it is in this stage that radium gives its best results. Marked improvements took place in six.

Eleven of the 12 unimproved patients were treated for recurrent lesions. The twelfth had a lesion three inches in diameter.

*Nasal Mucosa*

Three cases were treated. Two of them had advanced recurrent lesions. The third case was one of recurrent epidermoid carcinoma of the posterior portion of the nasal septum, occluding both nasal passages. An excellent result was obtained by removing the growths with a snare and treating their bases with radium. There was no recurrence in three months.

The difficulties of making accurate applications of radium to the nose are very great, unless the lesion is an early one and situated low down.

*Superior Maxilla*

27 cases of epidermoid carcinoma of the superior maxilla have been treated. Of these, 4 have undergone a retrogres-

sion clinically complete. In each case there was a positive diagnosis of epidermoid carcinoma. Two were well when last seen,—one of them, a year and a half after treatment; 11 were considerably improved. Of these, 2 are still under treatment and promise well. One patient was treated prophylactically after operation for epithelioma of the superior alveolar process, performed February 4, 1916, and is still free from the disease.

9 cases were only slightly or not at all improved; 6 of them had had extensive recurrences after previous operation; the three others had extensive growths when first treated.

*Cheek*

4 cases of epithelioma of the cheek have completely retrogressed and are to-day well,—one of them for over two years; 3 patients are still under treatment, all greatly improved. Several advanced cases failed to improve.

*Inferior Maxilla*

12 patients have been treated. Of these, one is an adenocarcinoma of the lower jaw, in whom the result shows that radium is a valuable agent in the treatment of this form of growth. 6 patients have been improved; three of them are still under treatment, and in 2 the improvement to date has been considerable.

*Floor of Mouth*

6 cases were treated: 4 improved, 3 of them still under treatment; 1 prophylactic; 1 unimproved.

*Cancer of Soft Palate, Tonsil, and Pharynx*

28 patients have been treated with good results, the more gratifying because cancer of this region is not easy of surgical cure. It is usually recognized early, however, and for this, as well as for other reasons, seems to yield to radium with remarkable rapidity.

Of 26 cases of cancer of the tonsil, 5 completely retrogressed; 2 of them are more than a year since treatment was begun; 15 are improved. Of these, 7 are still under treat-

ment. With the exception of 2 of the 15, all had advanced lesions involving portions of all the adjacent structures in the pharynx or were associated with large lymphatic metastases. 6 cases were unimproved.

### *Cancer of Tongue*

50 cases were treated. 2 were cured for more than a year and are still well; 24 were improved; 2 are still under treatment; and 24 were unimproved.

This form of cancer is difficult to treat on account of the vascularity and activity of the tongue, the abundance of its lymphatics, and the peculiar difficulties in the way of applying the radium to this particular organ. Of the cases treated, only four retrogressed. Of these, three are at present free from disease; while the condition of the fourth is not favorable, he is still living. 24 have been only slightly or not at all improved.

This disappointing record emphasizes the malignancy of cancer of the tongue. The four retrogressed cases were all early ones, and the two that did best were the two smallest lesions. By the time carcinomatous ulcer of the tongue reaches a diameter of 1 centimetre, the healing of it with radium becomes uncertain, if the disease has made considerable progress in the deeper tissues.

### *Cancer of Larynx*

27 cases; 1 cured; 10 improved; 16 not improved. Complete retrogression took place in four, but three of these died later from recurrence. One is now being treated for a small recurrence which is yielding, the patient being in a promising condition.

If it be true that the best results with radium are obtained in the early cases, then most of the laryngeal cases treated thus far have been particularly unfavorable subjects. In all personally seen at the Memorial Hospital by the writer, the disease had been of considerable duration and its extension such as to preclude operation. In several the cases have been

far advanced. A test of this kind is obviously unfair, and with our present knowledge sure to be unsatisfactory, for reasons well understood. I refer to the inequality of the action of the radium upon the new growth as compared with its action upon the surrounding tissues. Notwithstanding this, patients who have consented to radium treatment have often experienced marked temporary retrogression of the disease and have expressed satisfaction at the great relief from unpleasant symptoms they have derived from it. In intrinsic cancer of the larynx, recognized early and while localized, the lesion is essentially a superficial growth of the mucous membrane, upon a small area within the larynx. The conditions should be very similar to a corresponding growth developing upon any other mucosa of the body. This being true the probabilities of success from the application of radium to the intra-laryngeal growth would seem positive. It is very desirable that this proposition should be carefully tested. Judging from the experience already gained in the treatment of other superficial growths, a hopeful future awaits it.

Thus have we briefly summarized the results of three years of painstaking labor. Beginning with but a moderate stock of actual knowledge, the careful study of the cases treated has already brought many practical results. Not that any complete development of the subject has been attained. That still seems far before us. But enough has been and is being learned to offer abundant encouragement for the present and for the future substantial hope.

It is not my purpose to give a complete transcription of this report. To be at all appreciated, the work must be taken as a whole. Some of its salient conclusions, however, are too valuable to be omitted. Of these, perhaps that most important is that of the 422 cases treated but 21,—up to one year ago,—were early cases, in whom conditions justified the treatment of cancer in such a stage by radium instead of by operation. Up to the present date, the condition of these twenty-one patients leaves little to be desired, and if the present freedom from recurrence of one year lengthens to a three year period,—as

from all appearances it is likely to do,—the fact will be strong evidence that radium is indicated far in the direction of the earliest forms of cancer.

With regard to the possibly irritating influence of radium upon the surface of the body, the effects of over-exposure are serious, inflicting as they do additional suffering. Too great care cannot be taken to avoid it.

In the best cases reported, the retrogression has been produced by a single treatment. The greatest caution must be exercised in continuing the repetition of doses which are given with the intention of producing a cure.

Inside the mouth and in mucous membranes generally, it is questionable, unless a retrogression can be obtained in a few doses, whether or not to undertake the treatment of the case at all. In the more circumscribed growths of the mucous membranes, with which the effects of radium are most valuable, the initial treatment may be pushed if necessary to the point of producing considerable discomfort.

The successful cases given in the report of cancer of the mucous membranes are illustrative of the best service that radium in the light of our present knowledge can perform. In the majority of them the lesion was small and probably operable, but for some reason operation was deemed inadvisable or was refused. While all show complete clinical retrogression, this,—from the point of view of those who only consider as cured those patients who are well after three to five years,—may not be an absolute cure. The proof must be left to time.

In advanced cancer, any temporary benefit from radium is usually overshadowed by the later progressive extension of the disease. No patient of this class should be given treatment which will be followed by more than transitory discomfort.

To summarize a few of the points made in the report which seem to carry especial weight:

Knowledge of the use of radium is making steady progress.

The work of but one year in a single institution shows a marked advance.

As with surgery as applied to carcinoma, so with radium, far the best results are gained by the prompt treatment of early cases.

The question at once arises as to how long it will be before the use of radium will be proved worthy to supplant surgery.

## Discussion

Dr. Charles W. Richardson, Washington, D. C.: I am very much pleased to hear this paper of Dr. Delavan's. His hopefulness led me to investigate the use of radium in the treatment of laryngeal growths of the upper air passages, particularly so as I had been somewhat enthusiastic about the subject myself. However, my experience has not been such as to warrant my keeping up this enthusiasm.

I have had very unfortunate results after its use in five cases which I call to mind—four of cancer of the tonsil, and one of cancer of the cheek. They have all died. The cancer of the cheek was discovered very early. It was only about four to five millimeters in diameter when discovered and appreciated. The patient was one of my oldest, and really most intimate friend of life. We were born in adjoining houses almost in the same month; and I think he was sent to the same Institution of which Dr. Delavan spoke; at any rate, one of the Institutions in New York. He was sent by a Roentgenologist of Washington who knew the Institution and he received treatment there. He lasted about six months; the growth was discovered in March and he died in September last, with all the horrors of such cases—perforation of the cheek, destruction of the soft tissue, etc. Fortunately, he died from toxaemia and not from other causes.

In the cases of cancer of the tonsil which I have had, one of them was discovered real early; in the second I was in doubt as to the diagnosis when the case was seen, and they were both about as early as even seen. Both of these cases went to Baltimore under Dr. Kelly, whom we believe is one of the leaders in this method of treatment. Now these and the other two cases which were more advanced when diagnosed all died in the usual course of time.

There is, however, one thing to be said in favor of radium in the treatment of these cases, and that is the wonderful relief it gives from all the disagreeable symptoms. As they went along their course these cases did not look like extensive malignant disease of the tonsils, as we usually see them.

There was very little odor, and the lives of the patients were fairly comfortable and free from pain. One died from hemorrhage, and the other three from toxaemia, and this toxaemia came on one week and the next week they passed away. It was all very quick and they were apparently in good health except for the local condition. Until the time of toxaemia they were interesting in one feature, that they were all very much more comfortable, but they all four were fatal and fatal in about the time they would have been without any treatment at all.

I have another patient now passing away without any treatment at all, the patient being too unfortunate financially to avail himself of the radium treatment, and he is dying with all the horrors of this disease—probably is dead now.

I am very much pleased with this report of Dr. Delavan's and it helps to hearten us in the use of this radium treatment.

Dr. Robert Clyde Lynch, New Orleans, La.: I might ask Dr. Delavan in closing to give us just a little idea of the method of application of the radium in the larynx cases. I have four cases in my experience now, one of which I believe is definitely well. It is a case that has apparently been cured —at least the patient has had no recurrence for eighteen months. He received no benefit at all from the action of the radium until the radium was put in the laryngeal cavity through a tracheotomy tube. Seventy-five milligrams of radium screened over with a milligram of pure gum rubber was left in situ for eight hours, tied into the larynx by means of a catheter, and put in through a tracheotomy tube passed through the mouth, the radium slung between two strings, the lower string tied to the tracheotomy tube and the upper string to the teeth. In that way the radium was brought into actual contact with the diseased tissue. This was one of the cases that had a recurrence after dissection by suspension, and that recurrence has entirely subsided and the voice returned, and he is apparently well, that is, he has been well for eighteen months at least.

In cases we have had where we used cross fire, that is, by application of the radium externally, we have had absolutely no results at all as far as the growth is concerned, but going so far as to produce marked ulceration from destruction of the external tissues. I would like to know if Dr. Delavan would give us just a little hint as to the method of application in this regard.

In another case of endothelioma of the tonsil which we removed by block dissection of the tissues of the neck on the right side, there was apparent freedom from recurrence of the growth for six months. Metastasis then occurred in the other tonsil, and similar treatment was instituted to this other tonsil, block dissection including the superficial and deep vessels of the neck with ligature. Destruction of the internal jugular vein of the second side took place. This third recurrence was thought to be perfectly inoperable and the application of radium to this area caused perfect and complete subsidence of every evidence of the recurrence. It is now six months since this application, and apparently there is not the slightest indication of any recurrence of this metastasis to the second side. In this instance again we were able to apply the radium actually to the site involved, and I wonder whether inability to secure any results in the laryngeal areas is not due to the fact that the cartilage must act as an interceptor to some of the rays, or influence the action of the radium within the largngeal box.

Dr. E. Fletcher Ingals, Chicago, Ill.: I had a very interesting experience with radium last year. A patient came to me from a distant state with a growth in the pharynx running perpendicularly. It was about one and a half cms. in its antro-posterior and lateral diameters and about three to four cms. long; that is, it extended from the upper pharynx down to the arytenoid cartilages, but I could not determine how much further. The patient came with a history of not having been able to swallow for some time, and when seen she was much emaciated and in an extreme condition. I had a man who claimed to be an expert in the use of radium, make an application to this growth, and while I do not know anything about the length of time, or how much it is customary to apply, I should say the first application was not very strong or very long. He had the radium in a little metal capsule and left it there for a couple of hours. He made another application of longer duration in a couple of days. The effect of these was something marvelous; the growth simply melted away. At the end of a few days, I should say about eight days, the growth had all disappeared, but there was a large ulcerated surface that represented the base of the growth, and the most remarkable thing to me was that this ulcerated surface completely healed, so that after a few days more, one could not even see the scar. When the growth had disappeared from the pharynx I found that the patient still could not swallow, and I then was able to determine that she had

cancer with stricture of the esophagus lower down. The expert proposed to pass this radium down, but he did not know how to manage it. I then passed a catheter down to the obstructing point and measured the distance; then placed his radium in a catheter and passed it down into the stricture. The result of the first application was to open up the stricture very decidedly, and a later application opened it up (I was going to say completely) but certainly so that the patient could swallow very well. However after the second application in the pharynx the expert who administered the radium got enthusiastic (perhaps that is not the way to express it, but so it appeared to me at the time of the application) and the next time he left it too long and burned the throat so that it had much the appearance that it would have had if it had been burned with either boiling water or a hot iron. The throat became very sore and the patient had a great deal of discomfort for ten or twelve days afterwards, though it finally healed.

I do not know the dosage of the radium.

Dr. J. Payson Clark, Boston, Mass.: I have been in the habit of sending inoperable cases to the Huntington Cancer Hospital in Boston for radium treatment. I have not been much encouraged in regard to the curative effect on those advanced cases. Of course, that is a very severe test, but I want to add my testimony to what Dr. Richardson said in regard to the value of radium treatment in relieving the symptoms, especially the symptom of pain. I was very much impressed with the relief which was obtained in swallowing by patients who had before suffered a great deal.

Dr. Lewis A. Coffin, New York City: I have had a little experience in the last year with radium. I had become thoroughly discouraged as to its use in malignancy. However, we are glad to hear anything that adds a ray of hope in these forlorn cases.

A case of cancer of the tonsil comes to mind, which I referred to Dr. Freudenthal for the use of radium. It was not an advanced case, the man was working as a salesman, neither was it so early a case as Dr. Richardson reported. Notwithstanding the vigorous use of radium, the case went along practically as it would have done without treatment until death occurred.

Another case, one sent to me in the winter from the northern part of the State, was a woman having cancer of the larynx. I took her to the Radium Institute where the element

is now under the direction of a radiotherapist. It seemed to me that now we had the right combination—a man who knew how the radium should be used, and a man who could manipulate it as directed. The radium was in capsule and this was attached to an applicator with adhesive plaster. I held it in the throat absolutely in contact with the growth at various sittings, for one hour at a time; that is to say, ten minutes at a time, then a little rest, then ten minutes application again for six applications. This process was repeated once a week for three or four months. All symptoms were much relieved for a time—the woman could swallow more easily and there was less pain. But the glands continued to enlarge and softened. We thought it well to open up the glands at the softened points and let out the broken down tissue. At these points the radium was inserted into the glands and left there over night several times. The woman however lost ground rapidly and, as she lived in the northern part of the state, we sent her home, where she soon died.

Another patient came to my clinic with a growth on the laryngeal aspect of the epiglottis. Pathological examination showed it to be malignant. I asked an assistant to take charge of the case and use radium at the same institution. In this particular case it was just like adding fertilizer to poor soil; the growth seemed to be stimulated and to grow more rapidly than if we had not used radium. The last thing I heard of the man was that he had gone to the German Hospital where they wanted to put a tube in his throat. From this experience, I lost all hope with regard to radium and its effects. However, the radiotherapeutist was still enthusiastic and offered to treat any case that I would present for nothing; thus showing the greatest confidence in radium as a therapeutic measure.

Dr. Burt R. Shurly, Detroit, Mich.: I have had some interesting cases with radium in the last three years. It seems to me that the use of radium has resolved itself into a problem whereby all laryngologists should have a man expert in the use of radium ready to call upon in the same way that we have the X-ray man or pathologist, or some other special line of therapeutist to work with us. I am enthusiastic enough in the use of it to feel that it is our duty to at least use this method of treatment in all cases of malignancy where we so thoroughly understand that surgical methods are not sufficient to accomplish results.

There is one case in particular that I have had under observation for the last nine years, a superintendent of schools

in the State of Michigan, who during that time has been continuously at his work. I operated this case which involved the soft palate, the upper jaw and the antrum from time to time, three operations in all, and after each operation there has been a very slow recurrence. During the past three years we have used radium at intervals of from three to six months, and the radium has been passed into the antrum after the antrum operation and held there by the use of soft pliable copper wire which will bend in any direction you may wish. This makes a very ready method of application to the larynx, antrum or throat. It is stiff enough to hold in place and at the same time pliable enough to bend in any particular direction you may wish, and held in place by means of packing or adhesive plaster as may be indicated by the case.

Another case that I have had which has now been going on for about three years is that of one of our very celebrated men, a member of the Cabinet and at one time our greatest orator. His voice meant everything to him. By a series of applications of radium his case has undoubetdly been prolonged and been benefited and what looked to be a very speedy fatal issue has turned out to be a slow process that has now continued for three years.

I do believe that radium has a very decided field of usefulness, but that there is a great deal in the scientific application of it, and in the dosage and method by which it is applied, and I feel that it is a field within itself and we should have an expert who will help us in that branch of the work and upon whom we can call at any time.

Dr. Emil Mayer, New York City, N. Y.: I would like to have the reader of the paper in closing give us some statement as to what class of cases have done best. It is very possible that we may unintentionally do some harm to the patient in our attempts at making a diagnosis. Ought we not therefore learn of the experience of those who have followed these cases and found that perhaps it may be that those cases have done best where the diagnosis has been made clinically, and no attempt previously made to remove a part of the growth for microscopic examination to prove the diagnosis? Is it not true that such removal stimulates the recurrence of the disease? If we can have that made clear, it does seem to me that we may be able here to formulate some positive distinct rule as to the method we may adopt with safety.

Dr. Harmon Smith, New York City, N. Y.: I believe the good results obtained in the application of radium are due to

the varying virulency of all tumor growths, and that those cases which are benefited are less virulent than those which go on in their natural process of malignancy to fatal termination.

Some years ago I reported a case of carcinoma of the larynx which had existed for thirteen years before operation became imperative. The case was previously reported by Dr. Gleitsmann. This was unquestionably a case of carcinoma, and yet this man suffered pain and suffocation for thirteen years before consenting to have the larynx removed. Apply radium in a case like this and the natural deduction would be that the radium had produced the good effect.

I happen to be associated with the same institution as Dr. Delavan and I have sent a number of inoperable cases there, patients upon whom I had previously done tracheotomy. This is an institution where every facility is available for properly applying the radium in advanced cases, and each case has progressively gone on to death. In addition to these cases I have sent two cases of retropharyngeal fibroma and one ultimately died. The other suffered such burning and excoriation of the mouth that we had to feed him by rectum for a week, and instead of retarding the growth, it accelerated it. I recall sending another case of sarcoma of the tonsil for radium and here again there was no effect of a favorable character.

And so I believe it is with all cases; that although the microscopist may say it is a certain type of cancer, I believe those that are benefited by treatment are of a less virulent type than those which go on to death in spite of all treatment.

Dr. Norval H. Pierce, Chicago, Ill.: Something like eighteen months ago a gentleman came to me with a sore throat with slight pain and swelling, and upon examination I found a superficial ulceration on the left plica triangularis. There was very little infiltration and a little serpiginous ulceration. I excised this growth for miscroscopic diagnosis and Dr. La Conte of St. Luke's Hospital, one of our very best pathologists, pronounced it carcinoma. I was going away at that time and I did not see the patient again before leaving the city, although I told him when to come back and have something further done. As it happened I think Dr. Shambaugh saw this case while I was away. However, the patient did not come back as he was told and I hear lately that there has been no recurrence of the growth and that he is apparently perfectly well. I am quite sure I did not go outside of the confines of that growth in this excision for purely a diagnostic

purpose, and yet that growth pronounced by one of our ablest pathologists as carcinoma, had not recurred. It hardly seems possible and yet that is what happened. Based upon other experiences, I believe that while a growth may show the characteristics of carcinoma under the microscope, it may vary greatly in malignancy.

To my mind carcinoma of the larynx is the most important subject in our specialty and the application of radium in these cases is a subject which, at a very early date, should be placed upon a more scientific basis than it has been in the past. At the present time there must be an enormous number of these cases and I cannot see that we have arrived at any particularly well defined opinion regarding the beneficial effects of radium even at the present time. I can only state that my experience with radium has been in a broad sense disappointing.

Within the past two years I have had three cases of carcinoma of the superior maxilla involving the antrum, and without exception they have gone from bad to worse, although every means of applying radium has been followed, even to perforating the antral wall and putting a capsule of radium immediately into the growth. True, the pain has been diminished and the odor has decreased, but the disease has swept on as though nothing had been done.

I believe that if we depend upon radium for a cure in the early stages of laryngeal carcinoma, we will have about as much effect beneficially or otherwise as we would have if we depended upon faith. We only waste time. How, in cases of primary intrinsic early carcinoma of the larynx can we apply radium? Dr. Coffin says he holds it there for an hour. This is very difficult both for the applicator and the person to whom the radium is applied. It necessitates cocainization for this length of time, and to me it seems impossible to hold the radium in direct contact with the growth for that length of time. It is possible to have a tube made of gold with a fenestra in it corresponding to the location of the growth in the walls of this intubation tube, and apply the radium in this way, but it seems to me that the irritation of the tube or what not overcome the beneficial effects of the radium.

I have had a case recently in which we split the larynx and applied the radium without cutting away the growth, a case of leucoplakia laryngis, where I had observed the patient for four years. This leucoplakia was situated on both vocal cords. The patient was a Board of Trade man and when he became very busy with his voice on the Board, he would become quite

hoarse, but if he would rest his voice the hoarseness would largely disappear. But the leucoplakia remained unchanged for four years. Suddenly from one of these placques on the right vocal cord, the posterior third, a swelling began—a fusiform swelling covered by mucous membrane—and the patient went to California where a well marked cauliflower-like carcinoma developed. Cross fire had practically no results; his voice became somewhat improved, but the appearance of the growth remained the same. Then the question came up as to splitting the larynx and checking the growth by giving diathermy and then applying a capsule of radium directly to the growth through the split larynx, the larynx being kept open, for five hour periods. The larynx became very much inflamed and the last I heard of him was that there was a probable recurrence of the growth.

I believe that the only possible chance for cases of carcinoma of the larynx that has invaded the commissure is thorough removal by external means at a very early date, no matter how early. Whether we apply radium or not is immaterial; the only means of safety is a thorough operation and by that I mean laryngectomy.

Dr. James E. Logan, Kansas City, Mo.: My experience has amounted to almost nothing. However, since we have brought out in this discussion a certain amount of interest in the treatment of initial or early stages of carcinoma of the larynx, and that is to what I refer, it seems to me that an ideal treatment would be to use the suspension method in the very early stages of laryngeal carcinoma, before the surrounding tissues have become much involved. I believe if the suspension method is used and a local application of the galvanic cautery is made directly to the growth, comprehending or taking in all of the growth so far as is feasible, that we will have accomplished practically all that we could accomplish, if not more, than in an application of radium.

I have in mind a case that I will report to this Association—a very interesting case of laryngeal carcinoma—that I have treated not through suspension method, but by the application directly to the growth through a specially constructed electrode, and this case has extended over a considerable period. The patient was referred to me in 1908 and is living to-day. I reported this case fully at the Southern Section of the American Rhinological, Otological and Laryngological Society, and that patient is yet alive. I am, however, forced to report that at the present time the patient is in a very pre-

carious state having had metastatic conditions develop in the other tissues lower down. I have not seen the patient in three months, but from the reports which I get now, a metastatic condition has undoubtedly developed at the esophageal end of the stomach. This patient has passed at least seven out of nine years of very comfortable existence by the treatment that I inaugurated nine years ago. And, I will just throw out this word—that if as we are groping in the dark for a method of treatment for these initial cases or unusual beginning cases of carcinoma of the larynx, I think the method suggested will be of avail, and I believe that we will get further along with it than with the use of radium. If we are to judge from the literature pertaining to the subject, there appears to be very little if anything in the use of radium for such cases.

Dr. Joseph C. Beck, Chicago. Ill. (By invitation): It is about fourteen years since I started the employment of what I thought was radium in diseases of the upper respiratory tract, and only about five or six years ago did I find out (and then reported with negative results) that practically no radium was contained in the capsule that I was employing. Dr. Delavan stated very definitely in his report, and none of the gentlemen have touched upon this fact, that the Institute of which he spoke owns three grammes of radium—pure radium metal. I would say that probably it would be a good thing if a considerable portion of that amount was used. So far as I am able to learn from the literature on the subject, too little radium was usually employed, and yet when a small amount, say 150 to 200 milligrams, was left in situ for a period, say 24 hours, it burned the structures beyond repair, so that the remedy was worse than the disease. My results are absolutely negative as to cures of deep seated cancerous growths; I will not even say of far advanced cases, but of those which I would ordinarily class as operable. When radium was employed in such cases the ultimate result was either laryngectomy in time to save the patient, or an eventual fatality.

One of the gentlemen, I believe it was Dr. Shurly, mentioned a very important point, namely, that we must have an expert in applying the radium. That has been my experience. I hope Dr. Delavan will be able to tell us definitely the method of application employed at the Institution he mentioned—whether they use a straight up and down tube containing a space for intubation, or rather the method of Rogers of allowing the radium to remain in the larynx in the container, which is to my mind the best method.

Dr. Smith has touched upon an important point—the difference in malignant growths.

If Dr. Mayer would have us treat cases without touching the growth, it does not seem to me it would add anything. We will not know what we are treating. This does not appeal to me. If we do not have a microscopic examination of the growths we are treating, it seems to me the subject would not advance scientifically very far.

Dr. D. Bryson Delavan, New York City, N. Y. (Closing the Discussion): I greatly hesitate to occupy more of your time but if one thing has been made clear in the course of the discussion it is that the work which is being done at the Memorial Hospital in New York is very far in advance of anything that has been done elsewhere. It is for this reason that I have presented this resume. I hope that some will be interested enough to secure the full report. This may be done by applying directly to the hospital for it, or by buying it from the publisher.

Now, if anyone here can cure carcinoma, he can do more than I can. If anyone knows of any specific for malignant disease, the world will welcome the knowledge of it. At the Memorial Hospital those in charge are bending all their efforts and resources to find some cure for cancer, no matter what that cure may be. We are anxious to consider and to discuss every idea and every theory which may be presented. We want to weigh every suggestion made anywhere in the world bearing upon this subject, which will promise the slightest prospect of help. Among other things, it has been found that in this connection radium has interesting possibilities. In its report the hospital gives the results of its work in the radium department. It records the best that has been done with a very considerable number of cases in a period covering more than two years. When more time has passed there will have been thousands of cases, and of course more definite results, whether better or worse.

Now a few words in regard to the statistics. Of all the cases treated in this department, 184, there are a total of 22 or 12% which are believed to have fairly retrogressed. Seventy-nine cases, 43%, have improved. There are also 79 cases unimproved. This makes a total of 55% retrogressed and improved as against 43% unimproved. In cancer of the esophagus, stomach, etc., the statistics are about the same. Without claiming anything the officers of the Institution are trying to learn the truth, with all possible energy, and with the re-

sources at their disposal, upon a highly scientific basis. Such thorough and intelligent work has not been done and is not being done in the scattered, individual, ill directed efforts going on all about us. For example, the case of an associate who attempted short exposures of a minute strength to the interior of the larynx in a somewhat advanced carcinoma and seeing no result pronounced radium a failure.

As to the methods of applying radium, there are several. The method must be adapted to the case, and the ingenuity of the one managing the case must play an important part in the selection of the means of application. Dr. Janeway at the Memorial Hospital uses, among other methods, a small container furnished at each end with a hook by means of which the container is attached to the mucous membrane with sufficient security to prevent being accidentally dislodged. By using several of these applicators at one time the areas to be treated are easily reached, and the great loss of time in the repeating of single applications is saved. By this means it is possible to use the applicators very low in the pharynx. In case of accidental dislodgment loss of the applicator can be prevented by attaching it to a thread, as in intubation. If impossible to use the applicators through the natural passages, they may be used through a tracheal opening.

Dr. Lynch, has devised an ingenious hard rubber intubation tube, provided with a chamber through which the radium may be passed.

The device of Dr. Robert Abbe is simple, ingenious, and very effective. It is intended for the application of radium to the more remote recesses of the body, and is especially useful in the larynx and pharynx. It can also be introduced in any part of the upper nasal cavity, which is extremely difficult to reach by other methods.

An obturator has been described, like a plate for artificial teeth, extending backward to the site of the growth and furnished with grooves in which the radium can be placed according to the location desired.

Dr. Ingals has suggested that in the use of radium skill is required. I know of no procedure which requires greater skill than this. Those who have used radium most successfully, to my knowledge, have been the ones possessed of the greatest skill and experience, as for example, Dr. Abbe and Dr. Janeway. I have seen many of their cases. Dr. Abbe has the touch and instinct of an artist, and in his hands radium will give results which others do not seem able to

accomplish. It is certainly desirable that these cases should be entrusted to men of wide experience.

The hopelessness of cancer of the throat must be admitted. By far the greater number of cases die. We do not get the true statistics of the surgery of the larynx. They cannot be had, for no one will publish his failures. The truthful statement of them would make a sad record. It might therefore be just as well to exercise a little patience toward radium until we find out what it can do, and meanwhile to offer a word of cheer now and then to the men who are working very hard to develop its promising possibilties. Thus far the outlook, in view of the statistics at the Memorial Hospital, as compared with those of other methods, is anything but sad.

# REPORT OF A CASE OF CARCINOMA OF THE LARYNX TREATED WITH RADIUM

ARTHUR W. WATSON, M.D.

But few reports have been made, as far as the writer is aware, of the use of radium in malignant disease of the larynx. It is for this reason, rather than for any unusual element in the case, that I have ventured to report the following case before this Association.

Case: X, a physician, about 73 years of age, was referred to me Nov. 24, 1914, by Dr. B. Alexander Randall. There had been increasing hoarseness for a year, without inflammatory symptoms, pain or cough. The general health was good. The general history was negative.

Examination of the larynx showed a smooth, red, sessile growth or swelling on the left side beneath the vocal cord, extending from the anterior commissure backward about one half the length of the cord, and downward from the cord about one half inch. It seemed to involve the under surface of the cord. Movement of the anterior half of the cord was restricted, which caused bowing in phonation. The growth was sharply defined and the other parts of the larynx appeared to be healthy. A clinical diagnosis of carcinoma (epithelioma) was made. For obvious reasons, a microscopic examination was not made.

When first seen the growth was one that could, undoubtedly, have been removed by laryngofissure, but in consideration of the age of the patient and the fact that he was in favor of trying the effect of X-ray or radium, it was decided not to operate. For the radium treatment the patient was put in the competent hands of Dr. Wm. S. Newcomet, who began treatment on Feb. 8, 1915. The radium was applied to the outside of the larynx; eleven milligrams radium, filtration 1 millimeter of lead and 1½ inch of gauze, for 3 hours. This was repeated February 10th, 12th, 15th, 17th, and 19th (six treatments, 198 Mg. hours). March 1st the radium was increased to 20 Mg., filtration 1 mm. lead, ½ inch gauze, applied for three hours. This was repeated March 3rd, 5th, 8th, 10th

and 12th (six treatments, 360 Mg. hours). March 17th began 40 Mg. radium, filtration same as before, applied for three hours. Repeated on March 19th, 22nd, 24th, 26th and 29th (six treatments, 720 Mg. hours).

At this time, the results seeming unsatisfactory, there being no skin reaction and the growth appearing unchanged, Dr. Newcomet suggested that application of the radium within the larynx be tried. We then began, with the aid of the instrument maker, to construct an intubation tube that would carry the radium capsule and give the necessary filtration. Our first attempts were with hard rubber tubes, with a separate opening at one side to hold the radium, but we found that they had to be too bulky to enter the larynx without undue pressure. Finally we had one made of silver coated with celluloid, with springs in the lumen of the tube to hold the radium. This tube would have been very satisfactory, as it could be introduced easily and the patient could breathe without difficulty, but it could not be retained longer than about an hour, when it would be ejected. One difficulty was that the tube would turn around, on account of the unevenness of the laryngeal cavity due to the growth. A rigid wire attached to the tube and left in place, was tried, but it caused so much gagging as soon as the cocaine wore off that it had to be abandoned. Dr. Newcomet then returned to the external application of the radium in the following dosage. 40 Mg. radium, filtration 1 mm. lead and ½ inch gauze, applied five hours, July 3rd, 6th, 9th, 12th, 14th, 16th, 21st, 26th, 28th, August 2nd, 4th, 6th, 11th, 13th, 16th, 18th, 20th, 23rd, 25th (19 applications, 4,200 Mg. hours).

During the first three courses of radium applied for three hours, and employing from 11 Mg. to 40 Mg. radium, the larynx showed no change except slight congestion and a little increase in size of the growth. During the last course—40 Mg. applied for five hours, there was noted: July 22, 1915 (after 8 applications), "The growth is smaller and the voice is better." Sept. 23rd, about one month after discontinuing the radium, the notes say: "Growth apparently gone, left vocal cord a little slower in movement than the right, skin in-

flamed over larynx." Nov. 16th, 1915: "No growth or thickening, larynx looks normal, voice natural." June 28th, 1916: "No return, voice good." The same condition was noted in the fall of 1916, one year after entire disappearance of the disease.

On the second of April, 1917, the patient returned with hoarseness, which he had noticed for a month or more. Examination showed a small nodule beneath the edge of the left vocal cord near the anterior commissure, the site of the old trouble. Radium was again used, a few days later, 40 Mg. for 12 hours. The larynx was examined two weeks later. The growth was found to be smaller, the neck inflamed. April 25th, only a slight thickening remained. The voice was again almost normal. The same condition was present when last examined.

In reporting this case I have gone, perhaps too much in detail, into the amount of radium used and the frequency and method of application. I have done this, at the risk of being tiresome, because it seems to me that the matter of dosage is as important in the use of radium as in the use of a drug, and should be included in all reports of cases. To confirm this point, I would quote two sentences from a recent paper by Dr. James Ewing of New York, "Radium Therapy in Cancer," Journal A. M. A., April 28, 1917. He says "Without notable inflammation of the skin, without extensive necrosis of tumor tissue, and without destruction of the normal elements involved, tumor cells may be made to disappear, and the tissue returns to its normal state. This view, first stated by Wickham in 1908, has been supported by many later observations, which have also shown that the result depends partly on the nature and condition of the tumor, but chiefly on the dosage of radium."

Of published articles on the use of radium in malignant disease of the larynx, from 1911 to 1917 inclusive, I have been able to find only two. They are, "Cancer of the Larynx with Special Reference to Radium Therapy," by J. C. Beck, Annals of Otology, Rhinology and Laryngology, 1914, and "Epithelioma of the Larynx Treated by Radium," by C. G.

Coakley, The Laryngoscope, 1916. Beek reports four cases, all between 43 and 56 years of age. All but one were advaneed cases and the disease had invaded parts outside of the larynx; pharynx and neck, esophagus, tongue and posterior pillar. All died of the disease while under treatment or subsequently, the treatment having had no beneficial effect other than lessening of pain and prevention of necessity for traeheotomy. No mention is made of the amount of radium used or the frequency of treatment. Coakley reports the case of a man 71 years old, first seen in 1913. The growth occupied the anterior two thirds of the vocal cord, and was ulcerated. The case was observed over a period of two and a half years. There were three applications of radium at from four months to a year apart. The last was of 1,800 Mg. radium for five hours, others not stated. Considerable dermatitis seems to have kept up throughout. The eondition of the patient seems to have been about the same or not quite as good at the last observation as at first.

The case that I have related above will add one to those already on record, and they are very inconelusive. I believe, however, from the results that I have seen, that in suitable cases and with a better knowledge of the dosage, much better results may be expected, espeeially if the radium can be applied from within the larynx, which would be made easier by a traeheotomy.

### Discussion

Dr. Robert C. Myles, New York City, N. Y.: It would seem that some standardization is necessary in these cases. It is a question to be solved whether in the early stages of incipient cancer it is best to immediately remove the cancerous mass with the adjaeent tissues, and if it recurs to use radium, or whether it is best to use radium without microscopical examination. In this eonnection it would seem best to consider to what extent we would advocate either procedure if the growth was in ourselves. Judging from personal experience and observation, it is my belief that the average person who had a growth, or symptoms of a growth that is probably malignant, defers the question because they do not like to have it decided that they have one and hope against hope that nothing will be found. There is unnecessary delay caused by

that attitude of mind. A great many cases have come to me in which the physicians have temporized, hoping that it might not be cancer, only because of consideration and feeling they have for the patient. So, invariably time is lost at a time when I believe these things are curable, either by thorough operative procedures or by radium.

As far as the secondary or tertiary conditions of cancer are concerned, it seems to me to be unwise not to use radium for the hope it offers in the relief of pain and odor and the other phenomena connected with malignancy.

But, I think it is our duty to try to impress upon ourselves and confreres and upon the public (because the public themselves defer a diagnosis by not seeking prompt examination and advice) the possibility of a cure in these early conditions. If we did this I think that this dread of knowing would be more or less eliminated and that the statistics would be much better.

A point has been made in regard to complete diagnosis in suspected cases. I think it was Dr. Mayer who made the remark earlier in the morning that we should first try to cure the patient and leave the scientific diagnosis unsettled. On the one hand this is not conducive to progress; on the other hand, I do not know whether we can improve the physical conditions of a case which experience has shown us is malignant, by microscopic examination, nor do I see what the chances are of it being non-malignant by resorting to such examination.

Dr. Henry L. Swain, New Haven, Conn.: For one, I am very glad that we listened to Dr. Watson's paper, first because it was a model in the way it presented the dosage, method of treatment, length of treatment, etc., and secondly because it left us with a spirit of hopefulness which we had altogether lost after we exchanged experiences this morning and then listened to Dr. Delavan's resume in conclusion. We ought to be glad indeed of this ray of hope that Dr. Watson extends to us.

I want to add just one word. Dr. Delavan showed us Dr. Abbe's applicator and told us that it is possible to make an application to the interior of the larynx with it, sufficient to make a definite impression upon the laryngeal growth. I think it is like adding a new terror to death to think that one may not cure a patient after having put him through the disagreeable procedure that is entailed in splitting the larynx or doing a tracheotomy, when such intralargngeal application can be made with this applicator. Of course, one has got to have a

tractable patient and certainly a skillful hand in making the application, but given these two essentials, it is possible to do it. I know of a case which is now being very comfortably handled at Dr. Abbe's clinic with this sort of an applicator, but whether the result will be a cure of the growth or not, I do not know.

This is again a case of the old, old story. We went through all this years ago with the X-ray. We had then, as now, in our hands a powerful means of the possibilities of which we knew nothing and we learned by exchanging experiences in the various meetings all over the country discovering as we went along, that X-ray burns were produced, that we must use a filter, that we had to have adequate dosage, if we were going to get results. We are now doing the self same thing with radium. In exchanging these experiences now, it seems as if we must come to some conclusions. I think one thing is clear—that we should not putter around with other means, and if we are going to use radium, we should get at it early. Inadequate dosage is worse than nothing. On the other hand, we must not use such a tremendous dosage that we either kill the patient or the surrounding tissues.

We should all be duly thankful as said before for the ray of hope that Dr. Watson has interjected into this discussion—that by properly screened and adequately arranged dosage, it is possible to cure a case.

Dr. E. Fletcher Ingals, Chicago, Ill.: It seems to me that this paper brings out a most important point, that is, the matter of dosage. If I understood the paper correctly this radium was applied in comparatively small doses and frequently. I am under the impression that the dosage here is quite as important as it would be if giving strychnine—that is, if you give too large a dose it will do a great deal more harm than if nothing had been given. If we read the reports of the use of radium, we find that sometimes there has been great destruction of tissue from which at times the patients have died. We have got to work out the dosage if we are to have good results. Some patients can tolerate larger doses than others; as with nearly all remedial measures. I am under the impression that radium, X-rays and sun's rays act practically in the same way; they burn in every direction, where they can reach, unless properly screened off. All the weaker tissues burn out first, but if the dose is a little too strong the normal tissues will burn at the same time. If this is correct, then the dosage is by far the most important factor. I think this will have to be tested on each individual patient—

a small dose first, to be increased afterward according to its effects.

It happened that when I was treating the case I spoke of this morning I had under my care at the same time a patient with a large malignant growth involving the palate and tonsil. I did not make a microscopic examination as the macroscopic was typical and I thought best not to remove any tissue. I felt this was an opportunity to use X-rays with advantage. I have sent several people with malignant disease of the throat to a radiologist for treatment, but never before had any good results. There happens to be a man on the same floor as my office who uses the X-ray machine satisfactorily, and so I went with the patient to his office and directed him where to make the application. He used an iron shield with a tube about one inch in diameter which he placed in the mouth; it was designed to direct the rays accurately on the growth. I did not remain for the treatment, but afterwards I went myself to see how the rays were applied. I found the operator shoving the iron tube into her mouth, with her tongue rising up beyond it; so that whatever rays reach the growth had to first go through the base of the tongue. It did not seem to me that he was going to accomplish much in this way so afterwards I sent my assistant in to hold the tongue and see that the rays struck directly upon the growth. She had treatments every few days for several months and the growth, which was as large as a walnut, gradually disappeared until recently when I saw her, a few days ago, there was almost nothing of it left.

I think that we should follow a plan of treatment that will reduce the chances of burning by X-rays, sun's rays or radium to the minimum. We must not burn too much in our efforts to do some good. I am inclined to think that Dr. Swain's suggestion of not burning enough is not good, and that we are apt to burn too much rather than too little.

Dr. Arthur W. Watson, Philadelphia, Pa. (Closing the Discussion): I do not think that I have anything to add to the discussion. What I wished to bring out in the report was the question of dosage. I am of the opinion that if the dosage is too heavy, so that there is destruction of the normal tissues around the growth, cicatrical tissue is produced in which the malignant disease is more likely to recur. It seems to me that this may be the reason for failure to cure in some cases. But I believe that the best way of getting at the proper dose is by regarding what has been done in each case, instead of considering one application of radium the same as another.

# INTRA-NASAL DRAINAGE OF THE FRONTAL SINUS

E. FLETCHER INGALS, M.D.

*History:* The first reference to Intra-nasal Drainage of the Frontal Sinus that I can find are in Jonathan Wright's history of Laryngology and Rhinology from which I quote: "Ogston in 1884 declared that there was no possibility of introducing a probe into the frontal sinus from the naris; but subsequent work slowly demonstrated the error of this dictum."

Schaefer in 1890 proposed to drain the frontal sinus by enlarging the naso-fontal duct. He was followed by Winekler, 1892, and in 1893 Lichtwitz again urged the practicability of this operation, but for years the idea was discredited by most writers as dangerous or even impossible. Winekler's work in 1892 did much to show the practicability of the operation; however, on account of the difficulties he experieneed in passing a probe through the naso-frontal duct he recommended piercing the floor of the sinus between the anterior end of the middle turbinated body and the septum, for which he used a curved sound with a dull point.

In 1898 Scheier reiterated that it was practicable to enter the frontal sinus through the naso-frontal duct.

Spiess also advocated the procedure in 1899. However, none of these operations found favor with the profession and as stated by Wright, "When an operation was necessary the whole drift of opinion for ten years was toward gaining access to the sinus by means of an external operation."

After giving due credit to many workers for the development of the external operation, Wright refers to the symposium at the meeting of the American Laryngological Association in 1905 on disease of the sinus and the operations for its alleviation. He mentions my report at that time and subsequent reports by myself and Skillern in 1907 and 1908.

In 1906 Halle of Germany reported operations on ten persons, for enlarging the naso-frontal duct by an electrically driven burr, in which operation he protected the internal and posterior walls of the cavity by a flattened director held internally and behind the burr. In this paper he refers to the methods of Schaffer, Hajek and Grunwald of introducing metal sounds into the naso-frontal duct after removing the anterior third of the middle turbinated body; but he considered the operation difficult and often impossible. However, none of these really enlarged the drainage canal. In this same paper he referred to my operation as the only one that completely opened the naso-frontal duct; but he thought it dangerous on account of coming too near the tabula interna, *a fear which my experience has demonstrated to be unfounded.*

In 1908, R. H. Good of Chicago, and Vacher in France in 1910, advocated intra-nasal drainage. Referring to the internal operations advocated by these various writers, Wright says "they met with considerable criticism; but there is no doubt that in selected cases it has become the operation of choice with many rhinologists." In 1910 J. A. Thompson of Cincinnati proposed enlarging the naso-frontal duct by means of bent rasps. Good used rasps, chisels and biting forceps to cut away the nasal crest. Thompson in his operation designed to have the mucous membrane on the posterior aspect of the canal left intact to promote quicker covering of the enlarged canal with mucous membrane. He also used a director and has a groove on the back of his pointed rasp which he works along this director so that he may enter a smaller naso-frontal duct than could be done with the Good rasps. Segura in 1912 and Sullivan and Denis the same year advocated changes in the operations which they considered useful advances.

In 1912 H. P. Mosher at the American Laryngological Association recommended breaking through the anterior end of the middle turbinated body with a curette and working outward, backward and downward, breaking down the cells and the naso-frontal duct which is surrounded by them, destroying both the cells and the duct at the same time. He says

"Very little curetting is required to convert the anterior part of the labyrinth into a single cavity. In the roof of this chamber, usually in the anterior outer angle, the opening of the naso-frontal duct is placed."

In 1914, in the Journal of Laryngology, Rhinology and Otology for May, P. Watson-Williams in an excellent article presents a good historical sketch of the intra-nasal operation with fairly accurate descriptions of the various operations and describes his modifications of the other procedures. In the same number, Herbert Tilley describes his method, and refers with praise to Mosher's operation. He takes the position that when any operation is necessary an efficient intra-nasal operation is to be preferred unless symptoms indicate intra-cranial complications, unless necrosis or osteo-myelitis are present or unless ocular complications render a radical operation necessary; but he admits that anatomical conditions may interfere with the intra-nasal operation and he calls attention to the fact now commonly recognized that not a few cases of frontal sinusitis require no operation at all and that others recover promptly after removal of the anterior end of the middle turbinated body.

In 1915, Dr. O. T. Freer presented a paper to the American Laryngological Association on opening the Frontal Sinus through the nose. He gives a careful exposition of the anatomy and points out the dangers both of rasps and burr, but states that the latter properly used is a safe instrument. He thinks the drainage canal usually obtained is too small and becomes constricted by cicatricial bands. However, *this cannot occur if the gold drainage tube is left in position as I recommended.* He favors enlarging the ostium backward through the foveal ethmoid cells which may be easily broken down. He recommends numerous probes and small curettes which he uses in cleaning out the ethmoids and frontal sinus. He states that there is very little danger of perforating the cranial covering of the ethmoid cells, which is hard, though thin, unless it is directly attacked. Externally, however, the orbital wall is frail and is liable to perforation in any of the intra-nasal operations.

Without disparaging any of these operations, they do not appear to me to make adequate provision for keeping the canal open, excepting by its large size, and as we know from experience with other accessory nasal sinuses there is a strong predilection for closure of artificial drainage openings even though these may have been large.

Many laryngologists have considered it necessary to curette the frontal sinus in nearly all cases to remove hypertrophy, polypi, degenerated mucous membrane, exuberant granulations, and what Herbert Tilley calls the pyogenic membrane, but I am pleased to find that Freer agrees with the opinion I have held since the early days of intra-nasal drainage. He says "At first I was also under this impression, but experience has shown me that not only are these advanced degenerations exceptional but that the mucous lining of these sinuses is usually normal in appearance and that even if the pathologic changes mentioned do exist they are capable of disappearance under the influence of good drainage and ventilation unless there be caries of the bone or large polypi present." He does not therefore, favor systematic destruction of the mucous membrane which he thinks would prolong the period of recovery and suppuration. I heartily agree with this view and from experience believe that in a large majority of cases free drainage is all that is necessary and that vigorous curettage is a bad practice, although gently removing polypi or granulation tissue with the curette when these are present would undoubtedly hasten the cure.

In 1905 I gave a careful description of my operation and it has been described by several others in journals and textbooks with varying degrees of inaccuracy. I would not write about it again had it not been for a grotesquely inaccurate report of some remarks I made on the subject, that appeared in an abstract of our proceedings of two years ago. This report muddled the whole matter beyond recognition by any one not fully familiar with the operation. But there are also some new points suggested by my experience that are deserving of notice.

I hope now to make the matter so clear that the operation

can be readily and safely done by any one qualified to practice laryngology and rhinology. The furor for extensive mutilating operations on the frontal sinus has had its day, reached its zenith, and declined until now a large part of laryngo-rhinologists favor more conservative intra-nasal drainage in suitable cases, and have come back to the well known principle held by our forefathers, viz. that a suppurating cavity properly drained will usually heal if meddlesome surgery is avoided.

In 1893 I had under my care two cases of chronic long standing suppuration of the frontal sinus. Both of these patients lived out of the city and they came to me irregularly at intervals of weeks or several months. I gave them such relief as possible by detergent washes and occasional washing out of the frontal sinus but neither of them would consent to an external operation. Finally in one of these cases by repeated washing out of the sinus daily for a short time, and after a couple of weeks less frequently, and by following this washing with a 5% solution of protargol injected into the sinus, I succeeded in effecting a cure, although the disease had persisted for twelve years. There was no recurrence of the empyema in this case.

In the other case it was not so easy to treat the sinus locally and for a long time I pondered upon some effective method for enlarging the naso-frontal duct.

In 1895 the late Dr. A. W. Palmer of New York devised a frontal sinus drill which was described in the New York Medical Journal, March 2, 1895. This drill was illustrated in the 3rd and 4th editions of Dr. Kyle's book and in the 3rd and 4th editions of my own work. It possessed some elements of success and at first sight appeared practical; but it had no safety guide to confine it to the naso-frontal duct and I do not know that it was ever used. At any rate, it did not obtain popular recognition. I think, however, that I must be in a way indebted to Dr. Palmer for the idea which finally evolved into the burr which I invented. I concluded that if a perforated, bead-like burr, could be devised to be run into the naso-frontal duct over a small director, or safety guide, this

duct could be enlarged so as to furnish adequate drainage. After several experiments I succeeded in developing such a burr that filled the requirements and that has needed no material alterations. I tried this out on the cadaver and had it altered as needed until I was finally satisfied. This burr made a canal 6 mm. in diameter; and the guide was so arranged as to prevent any danger of the burr passing through the posterior wall of the frontal sinus. But I soon learned that a canal of this size left to nature would not remain open more than a few weeks; therefore, I fashioned a metal tube that I inserted into the canal which I hoped to keep in place by bending out sections of both its upper and lower ends.

On March 25th, 1904, I operated on the first living subject by this new method. This was the second of the two who had so persistently declined external operative measures. The drill worked perfectly and a good drainage canal was quickly formed but I had much more difficulty than I had expected in placing the drainage tube; indeed, it was a failure and I had to remove it after a couple of days. The canal in this case had so far closed at the end of 5 or 6 weeks that all of the old symptoms returned and I found that only a very small director could be introduced.

In the meantime I had perfected the spring-gold self retaining tube that I still use. Introducing the small steel guide, I ran in the burr again and then inserted the gold tube; which gave perfect drainage and allowed the patient herself to easily wash out the frontal sinus. As a result the sinus completely healed in a few months although it had been suppurating for sixteen years. The patient was so timid and so feared a return of her old headaches that she would not permit me to remove the tube until she had worn it three and one half years, although it had not been needed for more than about three months, for in that time the drainage canal had been completely lined by mucous membrane and there was no possibility of its closure.

As has been aptly stated by some one, whose name I cannot recall, the efficiency of an operation is not determined by

what can be done with it by its author, but by what can be accomplished with it in the hands of other surgeons. I am convinced that my operation can readily be performed by any properly equipped laryngologist and that it will prove effective in nearly all cases of chronic supuration of the

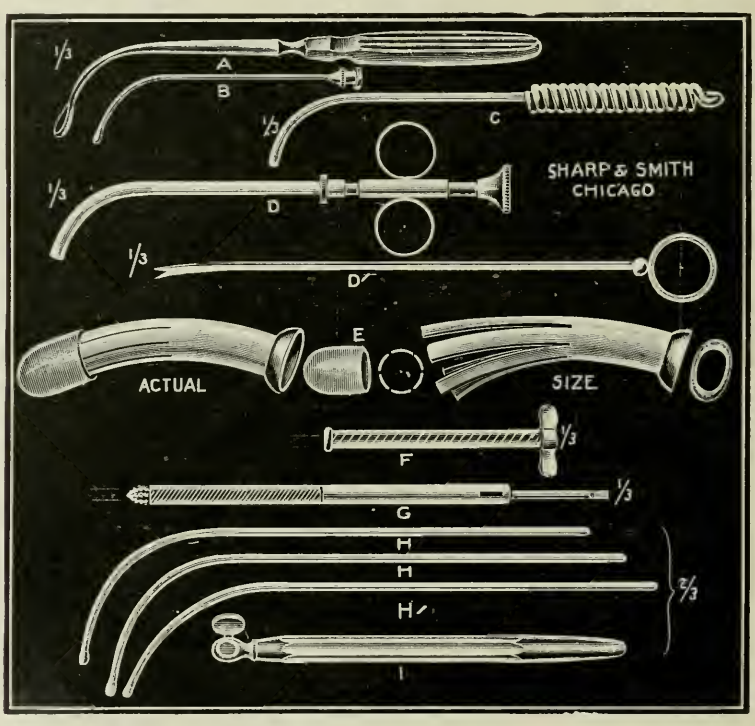



Fig. 1. A, Curette; B. Silver Canula for Syringe; C, Applicator; D and D1, Packer; E, Gold drainage tube—from left to right, first with spring ends covered by gelatine capsule, capsule, lumen of tube when springs are closed, tube with springs expanded and end of tube; F, spiral tube; G, perforated or bead-like burr; H, H, steel directors or probes, of different sizes and bent at different curves; H1, steel director of normal curve; I, handle for directors, or probes.

frontal sinus; indeed, I have placed the percentage as high as 95% of suitable cases and I have no reason to modify this statement; but of course in a pansinusitis involving the ethmoids and sphenoidal sinuses it cannot be sufficient. In cer-

tain cases of polypi or other growths in the frontal sinus, it will not be sufficient but it will establish permanent drainage even in these, and with such drainage many of them will recover without further interference.

The essential instruments for my operation are fine steel bent probes, 14.3 cm. in length by .6 mm. to 1.5 mm. in diameter, H to $H^1$ Fig. 1, that are introduced, with the aid of a removable handle, through the naso-frontal duct into the frontal sinus; a perforated or bead-like burr, G, Fig. 1, that is run in over this probe to make a drainage canal of adequate size and a spring-gold self retaining tube, E, Fig. 1, to maintain the lumen of this canal until it has become covered with mucous membrane.

A similar tube as large as the canal made by the operation would I think be a great help in the subsequent treatment in all of the other practicable intra-nasal operations. This tube not only prevents closure of the canal but it is a great help to the patient in washing out the frontal sinus, which can be done every day after the operation by the patient himself. With the eustachian catheter that I give the patient for washing out the sinus he can readily locate the metal drainage tube and irrigate the sinus without pain. In order that this operation may be made perfectly clear, I must repeat something of what I wrote a decade ago.

I first attach a silver canula 2 mm. in diameter to a two drachm syringe, B, Fig. 1, and pass it as far as possible into the naso-frontal duct, the lower orifice of which is immediately behind the uncinate process and external to the anterior end of the middle turbinated body. This canula is 10 cm. long and in order to allow it to adapt itself to the sometimes tortuous naso-frontal duct 3 cm. of its distal end is of soft silver. In order to avoid pain and to remove swelling the syringe is charged with 10% of cocaine in 1-4000 of epinephrin and as the canula is introduced about one minim of this solution is forced through it, about every two minutes, three or four times. In the great majority of cases the canula may after a few minutes be carried on into the frontal sinus; but sometimes the enlarged agger cells that occupy the upper part of

the uncinate process obstruct the passage, and in other cases the canula passes into the fronto-ethmoid cell and it is not possible to follow the naso-frontal canal; however, the region has thus been anesthetized and the swelling reduced. Then I try the steel probes and alter the curve as seems indicated by the direction the silver canula has taken. If in the adult the end of this probe can not be passed more than 5.2 cm. from the posterior inner angle of the nostril, I know that it has not gone into the frontal sinus. When it passes into the sinus the end of a probe bent from 30 to 50° will be 6 or 7 cm. from the point indicated.

In order to avoid all danger frontal and lateral skiagrams should be taken with the probe in situ and thus one may be certain whether or not it is safe to enlarge the canal to a diameter of 6 mm. I have examined a great number of anatomical specimens with this point in view and have seen only one where the burr could not have been passed with perfect safety. In that one the naso-frontal duct ran so close to the olfactory groove that almost any operation either internal or external to establish drainage would have opened into this groove.

In all cases the anterior third of the middle turbinated body should be removed before the operation. This allows more freedom of motion. I have done the operation two or three times without this procedure, but have regretted it, as swelling of this tissue is apt to interfere with free drainage and with irrigation. If possible the frontal sinus should be well washed out before the operation is done. After the safety of the operation has been proven by the skiagram with the probe in position, the naso-frontal duct and the frontal sinus are anesthetized by injecting into the sinus about a drachm of 5% of cocaine in 1-4000 of epinephrin. The whole naris is then thoroughly swabbed with vaseline. The probe, which should be of a length to project 4 or 5 mm. beyond the burr, A, Fig. 1, when the latter has been passed over it to the farthest extent, is then introduced and its handle removed. The shank of the burr is then attached to the chuck of the dental engine, and the perforated burr with the spiral metal

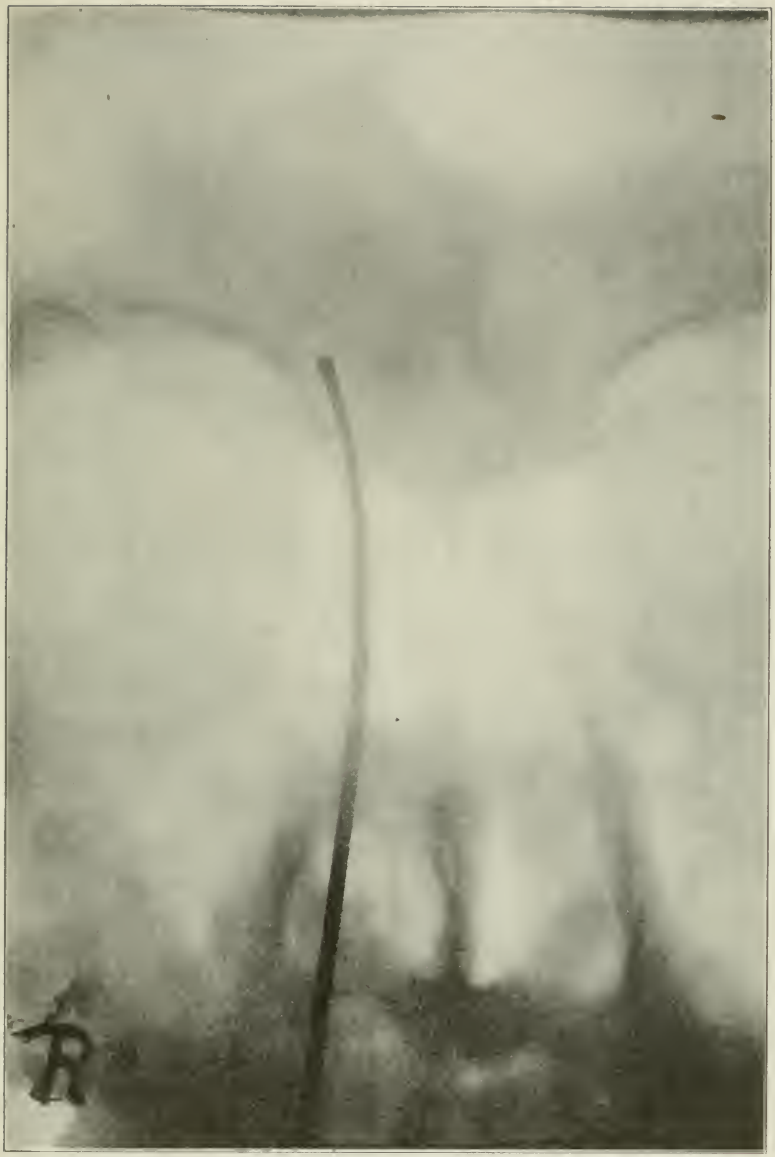



Fig. 2. Radiograph of case here recorded with canula in right frontal sinus. Outlines of right sinus obscured by pus. Left sinus small.

tube F, Fig. 1, over its shank is slipped over the probe and pressed up to the roof of the naris. The current is then turned on, slight pressure is made and in a second or two the frontal sinus has been opened.* I usually pass the burr up and down a couple of times to clear the opening of any obstructing mucous membrane and then the operation is finished excepting what might be termed the dressing.

In any of these intra-nasal operations it is very important to caution the patient not to blow the nose because of the danger of forcing air and septic material into the orbit or subcutaneous cellular tissue.

In this operation there is very little blood so that the field of operation is not obscured. When there appears to be any danger of injuring the posterior wall of the frontal sinus a strong thread is fastened to the distal end of the spiral tube F and kept from slipping by a narrow strip of adhesive plaster and when the burr has been passed up to the roof of the naris strong traction is made on this thread so as to draw it and the burr forward. When this is done, or when the probe has had to be bent more than usual, the enlarged canal has a curve that may not admit the other instruments or the gold tube; therefore in such cases as soon as the burr has been withdrawn I introduce another probe with the normal curve, $H^1$, Fig. 1, and then run the burr in again. I devised a shield to use in such cases, but now think this simple method better.

In cases where the end of the probe has been caught in a fronto ethmoid cell or stopped by the upper end of the processus uncinatus, I pass it in as far as practicable and then run in the burr, after which I have never yet found any difficulty in passing the probe into the frontal sinus and completing the operation.

When the burr has been removed, I pass in the bent tube packer D, Fig. 1, through which I introduce the end of a yard of a half inch strip of gauze about a foot of which has been saturated with a liquid formed by rubbing together equal

* A simple handle may be used instead of the dental engine and the burr run in by hand, which would require only a little more time in most cases.

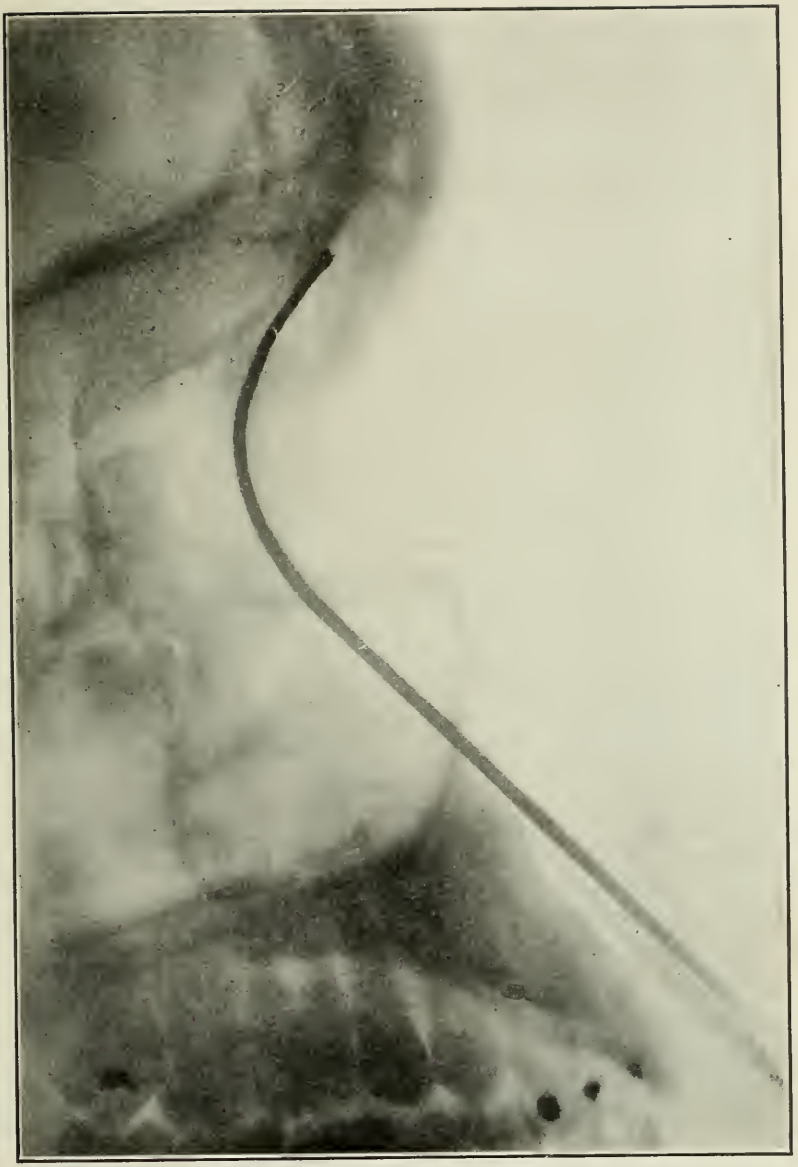


Fig. 3. Lateral view, canula in right frontal sinus. These two views show that the burr can be introduced without danger. Note extreme curve of the canula, as compared with normal curve H, Fig. 1.

parts of camphor and carbolic acid. This is a powerful antiseptic but not an escharotic. It is pushed on into the frontal sinus and allowed to remain about five minutes. The packer tube is then drawn down about half an inch so as to expose the raw surface caused by the burr and the gauze is slowly withdrawn, thus practically searing the raw surface so as to prevent absorption of the pus that will for some time flow down from the frontal sinus.

McF., A. O.—Figures 2, 3, 4, and 5 show the skiagraphs of an unusually difficult case of two months' duration following a crushing injury of the nose, forehead, and chest that had occurred ten months previously. The wounds had mostly healed leaving great deformity, which dislocated the landmarks so that it was difficult to find the orifice of the naso-frontal duct, and which had so changed the direction of the latter as to require an unusually sharp curve in the canula as shown in Fig. 3. This should be compared with the normal curve, $H^1$, Fig. 1.

In this case the end of the silver canula was engaged in the opening of the naso-frontal duct and a couple of minims of a 10% solution of cocaine in 1 to 8,000 of epinephrin were injected three or four times at intervals of about two minutes which reduced the swelling so that the canula was finally forced into the frontal sinus as shown in Fig. 3. This canula was only 1.5 mm. in diameter. Circumstances made it necessary to delay the operation two days and then the naso-frontal duct was so much more swollen that the canula could not be inserted more than 8 mm., which appeared to be about one-third of the length of the canal.

After as good anaesthesia as practical was secured the steel probe was inserted to the same depth and the burr run in; after which the probe could be inserted into the frontal sinus and the burr was run in the whole distance; but the curve of the canal thus made was so sharp that it had to be reduced by rasping out the anterior portion of the canal with Thompson's instrument. The gold tube was then introduced, but as shown in Fig. 4, it was too long and the drainage canal was so large that it was not securely held in place. In this in-

Fig. 4. Same case shortly after gold drainage tube had been introduced. Note that the tube was too long. The cellular appearance below the tube is due to rubber-sponge packing.

stance it was difficult to see the anterior end of the middle turbinated body which was the only landmark for finding the naso-frontal duct, therefore this was not removed until after the burr had been passed into the frontal sinus.

To prevent bleeding from this latter wound and at the same time to prevent the gold tube from slipping down, the naris was packed with a strip of rubber sponge 2.5 cm. wide, 6 cm. long, and 5 or 6 mm. thick. This packing is shown by the peculiar cellular appearance in the naris below the tube in Fig. 4.

Some days later when the swelling about the wound to the turbinated body had gone down, the original gold drainage tube was withdrawn and a shorter one inserted: Fig. 5.

In cases where I have reason to suspect polypi, granulations or swollen degenerated mucous membrane a small flexible curette, A, Fig. 1, is used carefully before applying the gauze. The vaseline that has been swabbed over the naris protects the mucous membrane from any irritating effects of the antiseptic. As the gauze is used in a single strip there is no danger of leaving any part of it in the frontal sinus unless it should be torn; however, it would be well to measure it before and afterward.

The spring ends of the gold tube E, Fig. 1, are pressed together by winding an elastic band around them, and slipped into a No. 2 gelatine capsule. The spiral tube F is then placed over the applicator C, Fig. 1, and the gold tube is slipped on its distal end. Thus the gold tube is easily introduced; the spiral tube is pushed up to hold it while the applicator is withdrawn. I then introduce the small steel probe once more to punch a hole in or push off the gelatine capsule which will dissolve in three or four minutes. The gold springs at once spread out and hold the drainage tube in position. If one has thought best to enlarge the opening beyond the size of the burr on account of diseased surrounding cells the gold tube should be of sufficient size to fill the canal; otherwise it may not remain in place. Lately, I have dipped the gelative capsule, after being applied over the gold tube in paraffin with melting point of 105-115° F. before in-

Fig. 5. Same case with shorter gold tube, which is in correct position.

troduction so that it will not dissolve before I have the drainage tube in position. This paraffin is broken by the expansion of the gold springs and very soon escapes with the secretions. The operation is thus completed. The patient has had the minimum of shock and pain; there has been no loss of blood; all the steps of the operation have been carried out under accurate observation, and the patient is not required to remain in the hospital, for he can wash out the frontal sinus as often as desired, without pain. For this purpose I give the patient a metal eustachian catheter bent to the same form as the applicator, which I mark by placing about it a strip of rubber plaster that will come to the nostril at its upper part when the tube is at the orifice of the drainage tube; then the contact of metal on metal will be recognized and the end of the catheter can be easily slipped into the drainage tube. A hand bulb with a fixture to fit the flaring end of the eustachian catheter is used to wash out the cavity. The mucous membrane from the frontal sinus, from the naris, and from the islands of mucous membrane opened up in surrounding cells soon spreads out, outside the gold tube and forms a complete mucous covering, thus leaving a canal 6 mm. in diameter that can not close and that approaches as nearly as possible to normal conditions. This is an important factor in preventing re-infection of the sinus when the patient subsequently gets colds in the head.

The drainage tube should be left in 3 or 4 months. It gives the patient no inconvenience. This operation in no way militates against a later external operation if that should be thought necessary; indeed it is an aid to the external operation as a large drainage canal has already been made into the naris, and it in no way interferes with subsequent operations on the ethmoid cells.

No operation in this region is free from danger and the greater the trauma the greater the risk. From my experience I believe this is the safest and that it will prove efficient in nearly all chronic cases and that they will recover as quickly as from any of the other operations.

In acute cases it is usually much more difficult to pass the

probe and when this cannot be done the operation is not applicable until some of the anterior ethmoid or the agger cells have been broken down by Mosher's or Watson-Williams' procedures.

It should be remembered that the nasal ostium of the drainage canal from the frontal sinus is located just external to the anterior end of the middle turbinated body and that not infrequently in both acute and chronic inflammations of the frontal sinus removal of a part of this turbinal will relieve the obstruction and insure recovery.

In a large percentage of acute cases the application of heat externally and especially by the Bruenings head light-bath,

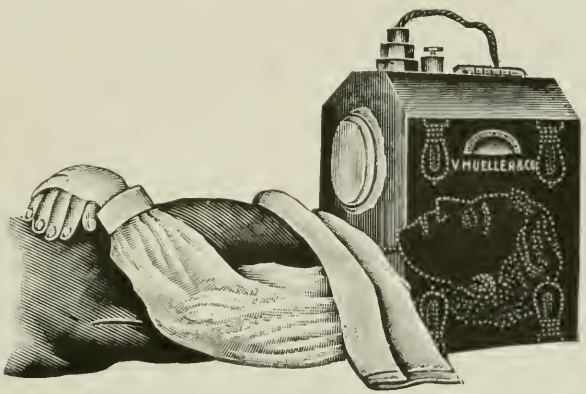



Fig. 6. Head-light bath. A thermometer that does not show in this cut, records the temperature. The patient breathes the outside air—connections not shown.

Fig. 6, frequent applications of appropriate quantities of epinephrin and cocaine will reduce the swelling so as to avoid the necessity of any operation.

In acute inflammation of the accessory sinuses, we obtain much benefit by the repeated use of heat, which is most conveniently applied by this head light-bath. The patient should be kept in bed and the bath applied from once to four times a day according to the severity of the symptoms. The electric bulbs are used to furnish heat, but probably have no other influences.

In using the light-bath, the eyes are thoroughly protected from the light. The box is placed over the head and the current is turned on and left until the thermometer shows 182° F., which usually requires about 15 minutes. The current is then turned off, but the bath is continued about 15 minutes longer until the temperature comes down to that of the surrounding atmosphere.

# FURTHER REPORT ON THE INTRA-NASAL TREATMENT OF ACCESSORY SINUS DISEASES

ROBERT CUNNINGHAM MYLES, M.D.

It would seem but wise and proper that one who, from time to time in the past twenty-four years has had so much to say concerning the intra-nasal treatment of accessory sinus diseases, should record what his best thoughts, experiences and experiments have produced. The author read a paper before the Laryngological Section of the New York Academy of Medicine on the fourth Wednesday in January 1893, twenty-four years ago. The title was "Diagnosis of the Diseases of the Accessory Sinuses and Their Treatment." On page 9, case seven, of the reprint from the New York Polyclinic Journal, you will note that I presented the patient with description of an operation which, as far as I was aware, was new. This operation was performed as described in the paper by removal of the anterior half of the inferior turbinal, and by trephining an opening through the naso-antral wall in the inferior meatus of sufficient size to allow moderate curettage with the malleable-handle curette, which made it feasible to pack the cavity with idoform gauze. On account of the failure to secure uniformly good results, I made use of the malar ridge and canine fossa route for several years; and then, after due consideration had been given to the cases with more or less unsatisfactory results, it was noted that very favorable conditions nearly always followed when the window through the inferior naso-meatal wall was not less than 15 millimeters in diameter and never contracted to less than about ten millimeters. In other words, a large permanent opening was necessary which allowed observation of pathological conditions and made tamponage, cleansing and discreet curettage feasible.

In certain cases where the patients were very old or very feeble, an operation through the naso-antral wall in the

middle meatus has been performed with the absence of shock, and has been followed by most remarkable cures. A short hooked knife on a firm shaft-handle is inserted in the hiatus semilunaris and the lower lip is severed downward and backward. The edges of the incision are pried with an elevator toward the septum and the parts are removed with the forceps. These openings have a less tendency to close because the intact mucous membrane on the upper lip naturally aids the patency. This indicates that ventilation plays an important part in the relief of these cases.

The curved strong cutting forceps presented have been found most useful for enlarging the opening in an upward direction in cases where the inferior meatal route is used.

Several cases of a single large polyps from the upper wall of the antrum of Highmore, which had made their exit through the hiatus semilunaris and which extended downward through the nose and formed a large mass in the rhinopharynx, have come under the author's care since* the publication of his paper on the subject, have corroborated the contentions made then and have been cured by the procedures advocated in the paper.

The writer continues to prefer the nasal route to the antral one for operation on the sphenoidal cells and strongly advocates making large openings in the anterior walls.

Partial success in an attempted submucous and sub-periosteal operation on the anterior wall previous to removal of the bony wall, and the utilization of the membranes for covering the lower sections of severed bone, encourages the belief that if this procedure is well carried out it will aid materially in preventing the too frequent closure of the sphenoidal openings.

In the ethmoidal cases the classical operations of the removal of the middle turbinal, the floors and the median walls of the cells are carried out. The cells which extend outward between the brain plate and the orbital cavity at times continue to resist our best efforts. In operating upon several

*Annals of Otology, Phinology and Laryngology, August, 1902.

cases within the last few years—where great pain, pressure and distress were complained of in the ethmoidal region, large cystic cavities with bony and membranous walls were found, which evidently had been there for years. Removal of the fluid contents and the major parts of hard bony walls as well

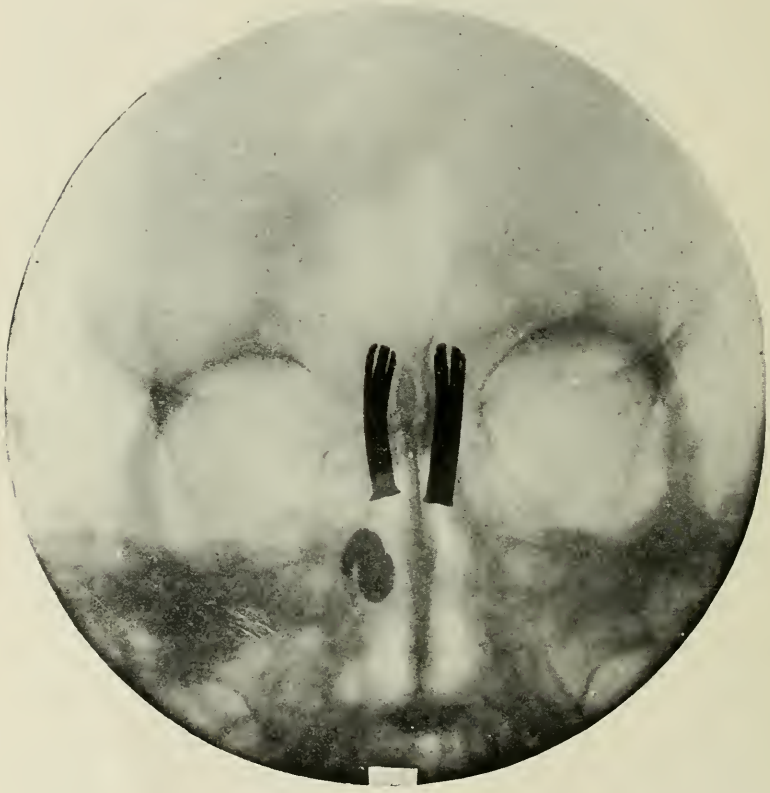
as the cystic membranous capsule, afforded magical and permanent relief.

The progress that has been made in the intra-nasal treatment of the frontal sinus diseases, centers around the methods for making permanent large openings from the nose into the sinuses.

Lothrop has presented a procedure which, if future experiments prove it to be safe, will be a most valuable addition to

our operations and technique. It is combined with a slight external opening, and should in my opinion, be classed with the internal operations.

After removal of the anterior end of the middle turbinal and the anterior ethmoidal cells, the writer uses improved designs of his outward-cutting chisels* for removing as much as is



possible of that part of the floor of the sinus which is formed by the nasal process of the superior maxillary bone. These instruments are used with a feeling of safety, as they automatically protect the dangerous areas in this region. Several

*Made by W. F. Ford.

of the most useful models are presented with this paper for your inspection.

X-Ray photographs are offered, demonstrating the openings, with Ingals tubes in position for temporary pressure on the incipient granulations. These were two of the most stubborn pathological sinuses that I have ever seen. The possessor —a handsome woman—asserted that she would prefer a grave to an external scar or deformity. She irrigates the cavities through the nose with perfect ease, using a silver eustachian catheter attached to a fountain syringe.

We have the records of many cases where the external operation was indicated, in which the preliminary internal operation was performed, to be followed by the external. The pain and distressing symptoms having been relieved, the consent for the external operation was withdrawn. Many of these cases are apparently perfecty well; some continue to discharge mucus or mucopus and others again suffer from cicatricial or granulation tissue with retention of secretion and gas. The use of the chisels affords them a temporary, permanent, or relatively satisfactory relief

Experiments have been made with various topical applications—nitrate of silver solutions from 1-10 to 100 per cent—with irregular results. In some cases, relief was decided; in others, no benefit was observed.

In certain cases in which I placed the patient on his back with head hanging over the table and injected the sinuses full of a 25% argyrol solution, a decided decrease in the secretion was noted. This position was used in order to fill the cavity with the solution. It would seem difficult to fill by means of a cannula, a frontal sinus which is full of air, in an upright position—since the air is lighter than the fluid.

The suction apparatus has been tried for removal of the secretion, but the abrasion of the soft tissues which at times caused bleeding, has made it objectionable in some cases.

## Discussion

Dr. Emil Mayer, New York City: I would like to make an apology for the abstract editor and would like to say that what Dr. Ingals complains of was not any garbling of any

original paper, but a mis-statement of the discussion which was very voluminous on the symposium. The original statement of the stenographer as to Dr. Ingals' standpoint was quite in accord with what he says to-day. The trouble lay in an attempt, within one hundred and fifty words, to make a description of an operation which omitted some quite vital and important things. I will say this that I question whether any laryngologist would take an abstracted report in any Journal and would attempt to follow any method or description of an operation. He would surely go to the writer of the paper or to the Transactions of the Association so as to get the correct report. However, all bad things, and this certainly was bad as Dr. Ingals and I and the rest of you also will agree, have their good ends, and the good end lies in that we have had again the pleasure of hearing from Dr. Ingals just how this intranasal operation is done, and how, after ten years, he finds that the operation is still one that he can recommend to us So, if you will forgive the abstract editor in part and the stenographer in whole, I think you will agree with me that something has nevertheless been gained, and particularly when I recall that in the early days of my membership in this Association when Dr. Bryan would get up and tell us something about the accessory sinuses, and the rest of us would sit there unable to take part in the discussion, because of our inexperience. From this and many similar instances, I think you will agree that we have learned something in the years last past.

Dr. Joseph H. Bryan, Washington, D. C.: There is no man in this Association who has higher admiration for Dr. Ingals personally, or professionally, and for his skill and judgment than I have, but his opinions differ so greatly from my own that I would like to get down to the basis of it all and find out wherein we do differ.

I have been able to enter the frontal sinus in the living subject too, but not in all cases. After having gone over the anatomical preparations in the cadaver so many times, I have found out that a great many irregularities exist in the accessory sinuses, particularly in regard to the frontal in relation to the ethmoid, and it makes me hesitate when I hear this procedure so ardently recommended as it has been by Dr. Ingals. There must be some difference in the cases that we have been having I am quite sure that no such method as the doctor recommends can possibly cure such cases as I have had. Now I have never yet operated on an acute catarrhal

or an acute suppurative inflammation of the frontal sinus. I have had considerable experience in this line. All of my cases have been of a severe form of chronic inflammation lasting a number of years. After going over his papers time and time again and trying to bring myself to believe that I could follow out the same line of procedure, I have been timid and have gone to the external method, and whenever I have one of these cases I have come to the conclusion that such an operation is not possible to relieve such cases. How it is possible in a frontal sinus with a prolongation extending far into the frontal bone and extending into the roof of the orbit and into the external canal, how is it possible by mere drainage to cure a case of that kind?

Now, in these chronic cases there is nearly always caries of the frontal region and it is not possible to cut the bone out or cure the condition by simple drainage which this method is directed to as I understand it.

In his hands, undoubtedly, the entering of the frontal sinus is practically an easy method, but is it a safe method or an easy method for the average rhinologist? While sometimes it may be very simple for those who are practiced in doing this kind of work, nevertheless, a man must always bear in mind that he cannot know what there is inside of that sinus without doing the external operation.

I believe that the external operation should not be discredited.

Dr. Henry L. Swain, New Haven, Conn.: If one chose to halt between the two opposite poles of this argument as just pronounced, it seems to me that we might assume the position taken by Dr. Myles. There are a great many cases where we refuse or hesitate to make an external operation. We are not all as successful as Dr. Bryan in having our operations clean up. Certainly I think there is a vast field for the procedures of Dr. Ingals in the medium cases, and in the severe cases we will bow to Dr. Bryan. We all have severe cases, but by far the majority we can get well by internal methods. This is safe and sane. Dr. Ingals has proposed one to us. I must say I have not done it; I am like Dr. Bryan, afraid to do it, from a knowledge of it gained solely by description even though it is profusely illustrated. I seem to get along with even milder means than Dr. Ingals suggests, and I do get my patients well, only rarely doing the external operations.

I have had this winter three cases which anybody would suppose ought to require external operation, where there was spontaneous external perforation into the orbital cavity, and

in one other disease went through the front plate of the frontal sinus onto the forehead. Presumably the process was severe enough to make the bone necrotic. All three got well simply by ordinary curettement of the fronto-nasal duct and opening the abseess in the orbit. The bone of the external plate was not necrossed, merely perforated and denuded. I have simply had good luck, but it shows the possibilities—that sometimes cases which seem severe do not require severe measures. In that way I agree heartily with Dr. Myles. There are these three classes of cases—those that get well without other treatment than simple currettement; those that require more radical intranasal methods; and occasionally a case that requires the external method. In this last group, Dr. Bryan has done monumental work. We all take off our hats to him.

Dr. Hanau W. Loeb, St. Louis, Mo.: I just want to mention a procedure which Halle published in the past two years which makes all these external operations much easier, and that is to make a flap of the mucous membrane covering the superior maxilla anterior to the middle turbinate. It takes away that thickness of the wall and also permits much more ready access to the frontal sinus.

Dr. George E. Shambaugh, Chicago, Ill.: I desire to speak in regard to Dr. Myles' intranasal operation. During the past ten years I have handled a great many cases of accessory sinus trouble. Acute cases rarely—if ever—call for any operative interference. The more I see of chronic accessory sinus cases the more I become convinced that intranasal surgery is all that is required. In case of the maxillary sinus our aim should be to get a large enough permanent opening to secure free ventilation. The old idea that this opening should be as near the floor of the sinus as possible to secure better drainage is a mistake. Now the simplest way of securing permanent ventilation of the maxillary sinus is by making a large opening in the middle meatus in the region of the so-called nasal fontanelle. Such an opening can as a rule be secured in a few seconds' time under local anethesia. No other treatment is required, and it is the exeeptional case which does not get well under this simple treatment.

As regards the frontal sinus, the situation is not quite the same. We are less frequently able by securing such an intranasal opening as to bring about a complete cure, and yet an intranasal opening is usually all that is required in these chronic cases. With the rare exception where after an operation of this kind the patient persists in having pain or symp-

toms which point distinctly toward retention, it is my belief that the external operation on the frontal sinus should be tabooed.

Dr. Greenfield Sluder, St. Louis, Mo.: This seems to me an interesting subject and always has been. I believe that all of the speakers are right. I think that when Dr. Bryan takes the stand that there are cases with a ramification of the frontal sinus under the roof of the orbit, out into the external angular process of the frontal bone, when it runs back to the lesser wings of the sphenoid and filled more or less with granulation tissue, that case will in all probability not get on by simple drainage. Dr. Roe, if I remember correctly in 1890, stated that he had deliberately left the antrum in one case filled with granulation tissue, put in an internal drain and left the granulation tissue alone, and that the case healed. Some five or six years ago I was in a frontal sinus externally and found it not specially enlarged or ramified but filled with granulation tissue. The case had been operated by someone else before and the nasofrontal outlet was blocked in solid bone. There was great headache. The bone was so hard that it could not be handled from within, so I went into it externally and found the cavity filled with granulation tissue, but put a drain into the nose and that was satisfactory. I did as Dr. Roe did and left the cavity filled with granulation tissue and that case healed.

I believe that the value of a satisfactory drain for all of these, whether they be frontal, ethmoidal, antral, or sphenoidal, cannot be too greatly exaggerated, but there must still remain a case that requires Dr. Bryan's procedure that must of necessity justify his ideas concerning these cases. It is difficult to tell how far it really can go. I remember in 1890 I had an antrum that had been suppurating forty years. The operation that was done was the old Cowper through the alveolus. I kept it open with a plug. I washed it and in some six months it stopped suppurating. It was always re-infected by coryza and healed with a few washings. The old gentleman died a few years ago. After I learned the intranasal procedure I offered him that and explained that it was a better procedure and would relieve him of his trouble and his plug but he declined to accept it.

Dr. E. Fletcher Ingals of Chicago, Illinois; Dr. Bryan thinks that if you cannot probe the frontal sinus it cannot be operated on intranasally. By persistence I have been able to probe ninety-five per cent. of chronic cases al-

though possibly in ten per cent., the probe could not be passed all of the way through the naso-frontal duct at first, being caught in a fronto-ethmoid cell, or stopped by the agger cells In such cases I pass the probe as far as possible and then run the burr in as far as it will go after which I have had no trouble in passing the probe into the frontal sinus and completing the operation. You will notice that these probes are of different sizes and curves. If a probe won't go in with a certain curve give it another; if a large one 1.5 mms. won't go in, take one that is one mm. in diameter. If you cannot get a probe into the frontal sinus you cannot do this operation. I think that even if the operation can be done there will be five per cent. of the cases where it will be necessary to do the external operation later on. I would not claim it as a cure-all by any means. The question as to whether the drainage alone will be sufficient to cure empyema of the frontal sinus is one we have to determine by experience. Experience does show that it is sufficient in most cases, even if there are granulations. It has seemed to me that scraping out all of the mucous membrane in the sinus is absolutely bad practice.

I do not recall any chronic case in which I have attempted to probe the frontal sinus where I have not succeeded, at least, after having run the burr in for perhaps ⅜ of an inch; but I will admit that it has sometimes taken me as much as an hour to do it. If I can get the probe in I am sure that I can make a large drainage canal very easily.

I believe that practically all the cases will heal if they have good drainage and I think that most of you will agree with me.

Dr. Robert C. Myles, New York City: About twenty years ago I was called "frontal sinus Myles." I was trying to publish the external operation; I had a lot of splendid results and a lot of bad ones. I was delighted to hear what Dr. Bryan has said. Some time I must come to Washington and get him to show me how he does it.

I had a patient who was operated upon about sixteen years ago for frontal sinus trouble. There was complete obliteration at the operation. He came in the other day to have me clean it out.

If you are going to obliterate you have to obliterate completely, but if you leave one small piece of mucous membrane in the sinus you will have trouble. Patients are coming to me all the time from the general surgeons with imperfect drainage. If you notice in my paper I mentioned the fact that they opened the sinuses and left them with a so-called

polypoid condition; they simply packed them. The reason of that is that these are not granulations, but an edematous condition called granulations. They will disappear; the condition is the same as the watery eye or the post orbital eye. It is a circulatory condition and not a pathological one. I admit of course that granulation sometimes comes from diseased periosteum.

But fundamentally, the crucial point in all of these cases is to get it open and maintain it open and keep it open, and the results in this way are better so far. I believe that five or ten per cent. of the cases have come to external operation, but we are now able to cure a large percentage of them by the internal method. The question of the necessity of distinction enters. I have lots of cases which heretofore I would have determined to require the external operation which are now operated by the internal procedure.

# GENERAL STREPTOCOCCIC INFECTION THROUGH THE ACCESSORY SINUSES AND THE TONSIL

T. H. HALSTED, M.D.

It is an experience, common to all of us, to meet with cases of chronic empyema of the maxillary sinus, which have existed for many years without the slightest suspicion on the part of the patient that he has anything more than an annoying post-nasal discharge which he regards merely as a chronic catarrh. While his general health may be impaired, this catarrh is the last thing his physician regards as the cause of his general disability, and it is not until the rhinologist has discovered the disease and drained the cavity, relieving not only the local symptoms but putting freshness into the complexion where formerly it was sallow or pasty, giving elasticity to the step where before it was dragging, that both the patient and his physician realize that there has been going on all these years a slow poisoning of the whole system. The patient was suffering from a general toxemia of years' duration from the local infection in the maxillary sinus. The same thing is true of the sphenoid and of the other sinuses. The cure of a chronic otorrhea by means of the radical mastoid operation brings not only an end to the ear discharge but a striking improvement in the general health of the individual as shown in his complexion, increase in weight, strength and general vigor. He has gotten rid of his local infection, his rheumatic symptoms disappear, his headaches diminish or stop, it is possible that he ceases to have recurrent acute inflammatory attacks in other and more remote parts of the body, such as for instance in the appendix, gall bladder, kidneys, nerve sheaths, joints, etc.

Chronic suppurations in these cavities are by no means local diseases in the sense that their effects are confined to these organs. The general surgeon, the internist, the neurologist,

looking for a primary focus of an infective or toxic disease in which he is interested must remember that these accessory air cavities are exceedingly often the subject of suppuration, and that their symptoms are often of such trivial nature that both patient and physician are entirely unaware of any disease.

It is the chronic infections, the staphylococcic, pneumococcic and streptococcic, that are perhaps of greatest importance because of the insidious and slow degeneration which their absoption produces in the whole system. It is these which are so commonly overlooked and their true significance so little appreciated by both those of us who are specialists and by the general practitioner.

Of equal and perhaps greater importance than local infections of the nose and their adnexa, though only in degree, are the infections of the teeth and of the tonsils.

It is a curious thing that of all diseased organs, the local suppurative diseases of the teeth should have been so completely overlooked by our profession. These bad teeth have been literally staring us in the face for ages, the odor of the breath of the victim of decaying and pyorrheic teeth has often nearly knocked us down, and yet, with the teeth crying for recognition we have completely ignored their call, hurriedly glanced beyond them and carefully examined the tongue which is comparatively seldom diseased, hoping from it to discover some stomach disease. The incredible lack of consideration by the physician of the teeth as an organ and a potential source of disease, forms a genuine tragedy in the history of medicine. Doubtless the fact that the teeth belonged to the dentist led the doctor to ignore them and their diseases, forgetting that they were part and parcel and a most important part of the whole patient he was treating, so often indeed the cause of the patient's illness.

Not alone the laryngologist, but every physician, regardless as to whether he is a general practitioner or a specialist of any branch of medicine, should carefully look over the teeth and the gums as a matter of routine in the first examination of his patient, and not hesitate to confer with the dentist and the roentgenologist on the slightest indication of hidden infective

disease that might have a bearing on the diseased condition under consideration. Clinical experience is showing that both the teeth and the tonsils are likely to be involved when either structure is. The laryngologist and the progressive dentist are fast recognizing this relationship.

The tonsils, whether the faucial, lingual or naso-pharyngeal, in a normal healthy condition, undoubtedly offer a hindrance and are a barrier to the farther ingress of pyogenic organisms to the lymph or blood stream. Conversely in a diseased and dilapidated condition, these same structures offer a habitation and afford the easiest way, becoming the open portal, for the passage beyond of the invading army of micro-organisms.

The tonsil, with its deep, narrow and tortuous crypts, is ideally located and constructed for the capture, detention and propagation of the streptococcus or other pyogenic organisms and fulfills all the requirements of a test tube for their growth.

As to the actual relative size of tonsils, Coolidge made an accurate measurement after their removal and found a very striking uniformity in size, just as striking as was their divergence as seen in the throat before removal. As to a given tonsil being a menace or a safeguard to the individual possessing it, it is not so much a question of size, as it is of position in relation to the pillars. In the one case, that of the so-called large tonsil, it is free, its crypts are large and visible and its drainage good. On the other hand the submerged tonsil may be just as large as the other, but instead of projecting freely, it is confined and more or less covered by the pillars to which it is attached by adhesions. Each recurrent attack of tonsillitis adds to the adhesions, the organ is drawn still further backward and behind the pillars, becoming more imbedded, its crypts more sealed and drainage blocked as is a test tube with a plug of cotton, until finally the tonsil may become absolutely buried leaving possibly only a slit like opening between the pillars through which is seen a small tonsil perhaps no larger than a pea, or none may be seen at all. This is the most dangerous tonsil of all. The tonsil, as large or nearly as large as ever, is there, the streptococci are there, growing in the crypts, developing their toxins, pro-

ducing a chronic localized infection with recurrent acute tonsillitis, mild or severe, accompanied by secondary infections or toxemias in other and remote organs or tissues of the body. It is not always easy to determine whether a given tonsil is diseased and the subject of focal infection. A submerged tonsil is in itself suspicious. The patient often denies having had tonsillitis at all, though perhaps admitting being subject to sore throats. All sore throats are not tonsillitis, but the vast majority are, especially those accompanied by general symptoms of headache, backache, malaise and pyrexia. In the absence of an acute inflammation, when the tonsil is seemingly normal and quiescent, a pillar retractor should be used, the crypts investigated, their contents expressed outward and examined. If diseased the excretion is likely to be yellowish, ill smelling, more or less cheesy in consistency or quite friable, or again quite fluid, this latter being usually streptococci in pure culture while the former contains various organisms, pathogenic and non-pathogenic as well as much epithelial debris. Both are evidence of disease of the crypts and are focal infections—the nature of the infection depending on the bacteriologic findings, and the parasitic or the virulent nature of the organisms perhaps estimated according to the history. A culture of exudate should be made, and the predominating organism determined.

Tuberculosis and rheumatism are in many important respects comparable diseases. Both are wide spread, affecting all ages and classes. In the individual both diseases may affect all organs and tissue, both have a decided tendency to chronicity, with acute exacerbations and relapses. There is perhaps an inherited predisposition in certain individuals to the development of one or other of both diseases. At one time or another, nearly every individual, if he live long enough, is pretty certain to have at least one attack of each disease. Again both are infectious diseases, one due to tubercle bacillus, the other to a specific streptococcus, and in both diseases the organism usually gains an entrance to the body through the mouth and throat, very commonly through the tonsil.

A mixed infection of the tubercle bacillus and the strepto-

coccus is of frequent occurrence. Just as tuberculosis is conveyed from one individual to another through the inhaled sputum, and is mildly contagious, so probably is rheumatism, *i.e.*, infectious streptococcic rheumatism. A person with chronic rheumatism, with or without recurrent acute attacks, but harboring in his tonsils the specific streptococcus hemolyticus, may infect in the act of kissing and coughing another susceptible person with susceptible tonsils living closely in contact with him. For the past two years I have been making inquiry of my tonsillar rheumatic patients as to the presence in the immediate family of other rheumatic persons and am struck by the very great frequency of such cases. I am convinced that we will soon regard this disease as being probably even more contagious than tuberculosis.

It is a matter of constant clinical observation, that with enlarged and diseased tonsils, not regarded as tubercular, enlarged cervical glands, thought to be tubercular, are often associated. The removal of such tonsils is usually followed by a reduction in the size of the enlarged glands. The focus of infection, or the port of entry of the tubercle bacillus has been removed and the enlarged cervical glands cease to receive their repeated infections. Streptococcic infection of the cervical glands from the tonsil is of equal or greater frequency than tubercular, and a mixed infection of the two organisms is of common occurrence.

That endocarditis is a frequent development in the course of scarlet fever and acute rheumatism has been recognized ever since these diseases have been diagnosed. It has long been clinical knowledge that endocarditis and arthritis often supervened or followed upon an attack of acute tonsillitis. Peritonsillar abscess, quinsy, has always been considered as occurring in persons of the so-called rheumatic diathesis, the error consisting in mistaking cause for effect. Long before the etiology and pathology of chorea was understood, it was well known to laryngologists that children with this disease were greatly benefited and often cured following tonsil and adenoid removal. The explanation was supposed to be that better nasal breathing was responsible for the improved con-

dition. It is clear, now that chorea is known to be a rheumatic or streptococcic infection of the nervous system, that the improvement results because of the removal of the primary focus of infection, the tonsil and the adenoid.

In childhood, tonsillar and lymphoid tissue is most prone to acute infection, and it is at this time of life that acute inflammatory rheumatism and endocarditis, usually following an acute tonsillitis, is most likely to occur. Acute inflammation of the naso-pharyngeal tonsil, the adenoid, gives rise to the same results so far as general systemic streptococcic infection is concerned, as that of the faucial tonsil. In the case of a faucial tonsillitis, the patient's local symptoms are those of a sore throat with difficulty in swallowing, and on inspection the swollen tonsil with the characteristic exudate is seen. When the adenoid is similarly inflamed, the local symptoms are rather those of a cold in the head, and the same exudate is not seen because it is not looked for; but it is there, and infection is carried from it to the heart and other remote parts as in the case of "tonsillitis."

It is only within the past seven or eight years, and more particularly within the past three, that much has been known of the direct infection from the tonsil to the endocardium and other remote organs by means of the streptococcus and other closely allied organisms, the infective agent being transmitted by means of the blood stream or through the lymph channels.

There have been many workers in this field, both in the laboratory and clinic, in all countries, as Poynton and Paine in England, Wasserman in Germany, Rosenow, Davis, Billings and many others here. The work of Rosenow in the laboratory in collaboration with Billings and Shambaugh and their associates in the clinic, has kindled a great amount of research work all over the country and has resulted in placing in our hands in an incredibly short time an immense number of facts, and has elucidated and cleared up many problems hitherto obscure, relating to acute inflammatory affections as well as to that long list of obscure diseases. vaguely termed rheumatic.

It is well established that the inciting cause of these inflammatory affections is most frequently the streptococcus in some one of its various forms, the pneumococcus which seems now to be one of them, the staphylococcus, the influenza bacillus, and many others not necessary to enumerate here. They are all of them commonly found in the mouth, where they live a parasitic life, harmless to the host most of the time, but taking on pathogenic virulence under certain conditions of change in themselves, or of the lowered resistance of the local parts in which they reside or of the general lessened resistance of the individual harboring them.

Just as we speak now of the general diseases, tuberculosis with its many local manifestations, syphilis with its innumerable localizations, so we shall soon be classifying a great many affections now regarded and treated as separate entities, under the general classification of streptococcic disease.

Appendicitis is not a local disease. The appendix happens to be, in a certain individual, a vulnerable point for the attack of streptococci which have been gathering and developing in numbers and in virulence perhaps at some remote focal point, and when everything is ready and conditions ripe, they enter the blood through some port of entry and go "en masse" to the weak spot—the appendix—and battle there. Had the appendix not been a structure weakened by a previous attack, the fight might have taken place in the endocardium, or the joints or the iris, the pericardium, the meninges, the kidneys or any other organ or structure of lowered resistance.

There are in all these streptococcic infections, certain essential elements, first the streptococcus itself, second the port of entry or gateway into the blood, third the organ attacked where the actual acute inflammation or battle ensues. One other equally important element, so far as the onset and the outcome of the attack is concerned, is the general health or resistance of the individual.

The streptococcus possesses some very striking properties. It is a large family of many branches and strains, with many degrees of virulence and contagiousness. Each possesses its own individual characteristics but is capable of taking on the

family features and changing its appearance and habit of action. The variety causing scarlet fever does not produce rheumatism, nor does the hemolyticus of infectious arthritis produce scarlet fever, though in all probability, several strains may be operating at the same time, producing a mixed infection. The streptococcus of scarlet fever seems to burn itself out in about six weeks' time, so to speak, in the fury of its attack, while the streptococcus of rheumatism keeps itself alive for months, or perhaps years, hidden away in a tonsil crypt, poisoning the individual with its toxins, slowly and continuously. Both these varieties of the streptococcus. as doubtless others, enter the general system through the tonsil, faucial and naso-pharyngeal.

The streptococcus hemolyticus, by Poynton called the streptococcus rheumaticus, may be transmuted into the S. viridans, or into a pneumococcus and vice versa, under certain conditions. Rosenow advances proof to show that each streptococcus also has a certain power to elect in which organ or structure of the host it shall reside or which part it shall attack. Seemingly it prefers, if transmitted from one host to another, to seek the same part in the new host that is occupied in the old; *i.e.*, if it is taken from or if its point of infection in one individual was the endocardium, it will seek or attack by preference the endocardium of the new host, and if his endocardium is of lowered resistance and cannot repel the invasion, an endocarditis will result. It is transmitted from one individual to another through direct or nearly direct contact, such as in the act of coughing, sneezing, kissing, the organism being inhaled into the mouth with the mucous from the infected person, or it may enter through traumatism by means of an infected instrument, or again it may reach the mouth through food, particularly milk, the milk having been infected by those handling it. A quite recent epidemic of streptococcic sore throat in Cortland County, New York, is an example of the latter. The mouth is the usual way by which the streptococcus enters the body. It is either soon expectorated, swallowed or retained in the crevices around diseased teeth or in the crypts and follicles of the tonsils.

There is a very important and very numerous class of cases of general streptococcic infection due to chronic tonsillar disease that is very commonly overlooked. In this same class of cases the teeth should be suspected and thoroughly investigated. These patients are usually adults, perhaps more often women than men. They have no very definite complaint beyond that of tiring easily, a good deal of headache, perhaps malaise, listlessness, and exhaustion. Their complexions are nearly always sallow or pasty, dark under the eyes, their mucous membranes pale and they are often under weight. Their breaths are usually bad, attributed by them to their stomachs, and their hemoglobin is low. The tip of the tongue depressor applied to express the contents of the crypts, shows at once the cause of the bad breath to be in the tonsil. They are suffering from auto-infection and have, nearly all of them, been treated for intestinal auto-intoxication, without effect. Billings refers to this class of cases in saying "That there can be no doubt that the insidious, slow, degenerative processes which occur in many patients who arrive at the meridian of life, are due to slow intoxications from chronic focal infections, variously located."

A form of toxemia, which otologists frequently meet with is that of toxic labyrinthitis, accompanied by Menieres' symptoms. Undoubtedly this affection very often is caused by the toxins of the streptococci, whose manufacturing plant is in the imbedded tonsils of the affected individual.

A case seen by the writer during the recent epidemic of poliomyelitis was that of an adult of 30 years who suddenly developed distressing vertigo, nystagmus, tinnitus, increased deafness, soon followed by facial paralysis of the same side as the affected ear. The question that immediately arose was as to whether the neuritis of the cochlear and vestibular branches of the 8th nerve and of the 7th nerve was due to poliomyelitis or was a streptococcic infection or toxemia secondary to his grossly diseased streptococcic tonsils. It was the opinion of his general physician, a neurologist, and two otologists who saw him in consultation, that the disease was most likely of tonsillar streptococcic origin and as a result of

this opinion, tonsillectomy was later done by the writer, followed by decided improvement in the vertigo and facial paralysis which had persisted.

The principle of the treatment of streptococcic disease, especially of a chronic nature, or of one with recurrent acute attacks, is to discover the primary focus of infection, wherever that may be, and treat it—the focus. If this be one of the accessory sinuses, that sinus should be treated properly, good permanent drainage established.

Autogenous vaccines, though frequently employed, a few times successfully, have usually proven disappointing in my hands.

As for the treatment of streptococcic infected tonsils, complete enucleation—tonsillectomy—is the rational procedure. Tonsillotomy is unscientific in that the deep, diseased parts of the crypts are simply cut off in their middle, adhesions following the operation partially or completely seal them, the drainage is made worse than before, and the patient is left more liable to systemic infection than he was prior to the operation. The patient has been injured, rather than helped, so far as getting rid of his focus of infection is concerned, though his nasal breathing may be improved. When the infected adenoid is removed, it should also be excised as completely as possible.

After the tonsils are removed, the patient may still show evidence of remote or general streptococcic infection. This means simply that there still remains a focus somewhere, possibly in the adenoids. Possibly the tonsils were not completely removed, even though the operator was most careful, a small piece, no larger than a pea, remaining in the supratonsillar fossa or at the base, adjoining the lingual tonsil, and if such is the case, this fact should be recognized and dealt with by a second operation, the sooner the better. Again an apical tooth abscess may have been overlooked or the difficulty may lie in a secondary focus in the gall bladder, the appendix, some joint, the endocardium, pleura or other localized area. This must be dealt with as best can be, the proper treatment of which, however, is outside the sphere of this paper.

# THE SUSCEPTIBILITY TO INFECTION MANIFESTED BY THE REMAINS OF INCOMPLETELY REMOVED TONSILS

HANAU W. LOEB, M.D.

Much discussion, verbal and written, has been ventured on the influence of the tonsil in arthritis, nephritis, endocarditis, and kindred processes. In most instances, the tonsil is brought to the bar for indictment and the punishment is assessed on the basis of the utter hopelessness of its conserving any useful purpose whatsoever.

In reference to the remedy, the tonsillectomists have fairly routed the tonsillotomists as there has been little difficulty in establishing the insufficiency of tonsillotomy. With this phase of the subject this paper is not concerned; it is rather an effort to justify absolute tonsillectomy by showing what may result when the operation is incomplete. In other words, the determination of the operator to perform a tonsillectomy by no means assures an entirely complete operation.

This may be due to a number of causes.

1. The operater's technic may be poor. He may make a stab at one of the numerous operations and may leave a fair portion remaining. He may make several attempts at forcing the tonsil through the ring and content himself with the small portion which he happens to snip away. He may undertake a dissection operation and through faulty technic or carelessness fail to remove all of the tonsil.

2. Operative accidents may interfere with the complete removal of the tonsil. Thus, the presence of hemorrhage may hide the portion of the tonsil that remains. This is a common cause to which may be added the timidity of the operator to proceed with any further operative manipulation when the hemorrhage is severe.

When the dissection does not uncover the entire tonsil, the operator may be unaware of the presence of the hidden portion. This is particularly to be noted in connection with the

upper pole of the tonsil which often required a careful dissection to reveal. On the other hand, the lower pole may escape attention by reason of the failure to depress the tongue sufficiently.

3. The very general feeling that if the bulk of the tonsil is removed, the remaining tonsillar tissue will atrophy or, in some pleasing but indefinite way, disappear altogether. This encourages the operator to desist in his work even if it is incomplete—a not uncommon occurrence. However, experience has demonstrated to me at least the utter fallacy of this particular premise. If a portion of the tonsillar lymphoid tissue is left after operation, especially if it happens to contain a crypt, it is very much inclined to persist in *statu quo*. It may never occasion any unpleasant result, but it is present nevertheless with its susceptibility to infection, reduced though it may be. What is considered an atrophied tonsil usually signifies that the tonsil tissue has become somewhat more covered by the anterior pillar and has in part simply disappeared from view.

From the foregoing it will be readily seen that in view of the great popularity of tonsillectomy, there must be a not inconsiderable number in which tonsillar stumps remain even in the practice of the most experienced operators. It is strange therefore that there have been so few reports of infection originating in such tonsillar remains.

Crowe, Walker and Rotholz called attention to eight cases of infectious arthritis occurring in the remains of the tonsils after incomplete tonsillectomy. In these cases it was found that the orifices of the crypts had been narrowed, thereby mechanically favoring the occurrence of a general infection. The same authors claim that harmless hypertrophied tonsils may in this manner be made susceptible to the influence of general infections.

I myself have met with a number of very interesting cases that bear upon this subject, some of which have occurred after incomplete tonsillectomy performed by me and some by others.

Case 1. Miss W., nurse, age 18, in April 1913, was taken with an acute tonsillitis followed by mild arthritis in both

ankles and one knee joint. Recovery was fairly rapid. There was a history of previous attacks of acute lacunar tonsillitis but so far as could be ascertained there had been no joint involvement. Her tonsils were removed on May 15, 1913. However, on one side (Fig. 1) there was a small mass of tissue which remained after the operation. Subsequent to this time she had several mild attacks of acute tonsillitis in this small

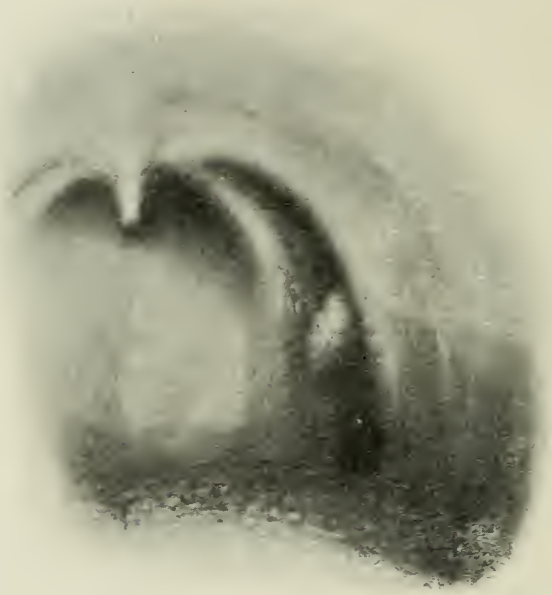


Fig. 1

mass remaining, accompanied with acute arthritis and endocarditis. The little mass was removed on June 27, 1914, and since that time there has been no recurrence whatever of the arthritis or endocarditis.

Bacteriologic examination after the first operation showed Gram-negative staphylococci from both tonsils and no other organisms. From the second specimen there were found diplococci, streptococci and staphylococci.

Case 2 was very similar to the one just reported with the exception that the patient suffered from endocarditis in addition to the arthritis previous to the tonsillectomy. The mass that remained was slightly larger, as shown in Fig. 2. The first operation was done February 3, 1915, and the second operation April 28, 1915.

Staphylococci were found in both tonsils, and on the left side there were bacilli which grouped like Klebs-Loffler, but

Fig. 2

were somewhat thicker and showed a negative Neisser. No streptococci were present.

Case 3 is particularly interesting. Dr. W., age 43, had had a tonsil operation performed in 1898, for the relief of recurring peritonsillar abscesses. After the operation he had had but few attacks. On April 23, 1913, the remains of both tonsils were removed with the exception of a minute crypt as shown in Fig. 3. In February, 1916, this small mass became acutely inflamed and within a day or so there followed a severe attack

of acute arthritis involving both knees and both ankles, accompanied by acute endocarditis. The attack lasted for over two months; the case is here reported because of the evident relation which existed between the minute remains from the incompletely performed tonsillectomy and the polyarthritis.

Case 4. A. L. was taken with a very acute and rapidly progressing tonsillitis early in September 1914, more marked

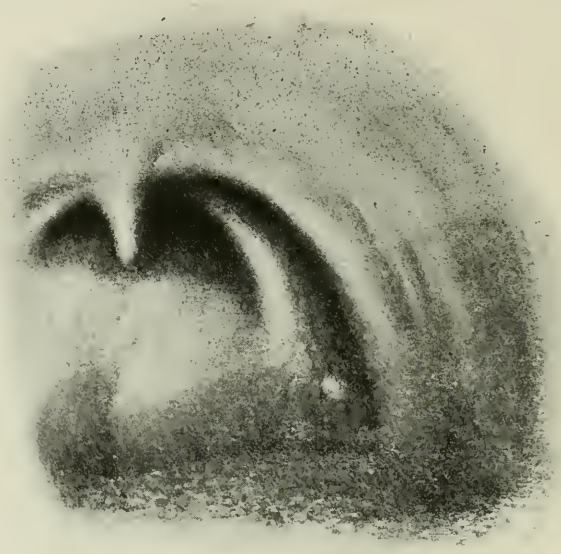


Fig. 3

on the right side. When I was called to see the patient on September 11th I found that a gangrenous process had already set in and in addition to the sepsis, he suffered from fairly severe hemorrhages several times a day. Examination showed a streptococcal infection with an added Vincent's angina. After very careful attention, he recovered and on October 22, 1914, I removed both tonsils, completely I thought. As the case went on to resolution, I discovered a single crypt with tonsil tissue equalling a wheat grain in size, on the right side. Since that time, less than four years, he has had six attacks of an acute infection in this crypt, accompanied by pains in the

joints, slight nephritis and general depression, all of which leave as soon as the minute abscess which forms is opened.

Case 5. (in the practice of my associate, Dr. Westlake).

V. S., age 21, had had several attacks of tonsillitis, one of which accompanied by arthritis occurred two years previously. The patient when first seen, on March 20, 1916, was suffering from a severe attack of polyarthritis which had been preceded by tonsillitis. Tonsillectomy was performed during the attack on March 27th. The arthritis at once subsided but she returned three weeks later with a sore throat and soreness in the left ankle. A small stub of the lower pole of the left tonsil which had been overlooked was found inflamed. This was removed and up to the present time she has no other arthritic symptoms.

These cases definitely show that small masses of tonsil tissue overlooked or at least not removed at the operation, are susceptible of infection with remote effects similar to those which follow acute tonsil infections.

They must have their counterpart in the practice of other larygologists and from my own experience, must be common enough to constitute a fairly definite clinical entity.

They present a decisive argument against any form of operation which does not contemplate the entire removal of the tonsil, especially where there has already been some infective process originating in the tonsil.

They suggest the advisability of following up cases of tonsillectomy to determine whether any portion remains and whether it has become a focus of infection.

## Discussion

Dr. George B. Wood, Philadelphia: I want to emphasize one point, and that is, the difficulty in recognizing when a tonsil is responsible and when it is not responsible for general infectious processes. My own experience has led me to believe that inspection of the tonsil itself helps very little in the determination of this responsibility. Frequently small, apparently innocent tonsils, give rise to certain general infections, while on the other hand large ragged tonsils with masses of epithelial debris in the crypts are found in appar-

ently normal individuals. The history of the case is of much more value. Also the enlargement of the glands of the neck, the relation of the tonsillitis to the recurrent arthritic conditions, will give us more imporant data than an inspection of the tonsil. Maybe of exceeding value is the bacteriologic study of the contents of the tonsillar crypts, and the determination of any relation between the cryptal organisms and the blood reactions of the individual. For instance, if a person is suffering from chronic tonsillar absorption for a considerable length of time, there ought to be some development of immune bodies in the blood, which may be found by agglutination and complement fixation tests.

In reference to Dr. Loeb's paper, he has brought a very important side of the tonsil question to our attention. I have had three or four cases of post operative abcesses occurring in patients in whom the tonsillar fossa was apparently free from any tonsillar tissue. The abcesses were situated in the posterior pillar and resembled minute quinsies and also showed a distinct tendency to recurrence. The only way I can account for them is that there was a small inclusion which was not recognized.

As to the possibility of recurrence of tonsillar tissue when once thoroughly removed, I believe such can take place. I am sure I have seen tonsillar wounds that were healed over three or four weeks after operation, without any evidence of tonsil remnants remaining, and yet on seeing these cases a year or two later, there were distinct deposits of lymphoid tissue on the tonsillar scar. It is true that the tonsillar tissue in these cases is very superficial with very shallow crypts and similar to the lymphoid nodules we see on the posterior pharyngeal wall.

Dr. Burt R. Shurly, Detroit, Mich.: With regard to Dr. Loeb's paper, he has undoubtedly taken a very interesting subject, because there are a good many problems connected with complete enucleation which are not thoroughly understood by the people at large. First of all, many people think that when their tonsils are removed they will never have another sore throat, and that is not properly explained sometimes by the man who does the operation. Again, we have certain islands of tissue that are perhaps more frequently left in place, and undoubtedly, if we take into consideration all the different operations we have done throughout the years, we will find a very considerable number of incomplete operations. On the anterior pillar, itself, very frequently even when we

think we have accomplished a very complete operation, we find tiny islands of tissue which can only be observed by a most thorough examination. Many times when we think we have done a most complete operation and go back over the ground again, one, two or three times, we still find some tiny islands of tissue we have left, and if this happens to be in the velar lobe, or on the anterior pillar, it frequently gives rise to more trouble. I do think, though, that there is great danger of exaggeration as to just how much damage results from leaving some of these tiny islands of tissue. It is certainly a matter which destroys the confidence of the public in us when some other man sees a case and immediately says, "My, my, your tonsils have not been taken out," and a few weeks afterwards he removes some tiny insignificant amount of tissue. I have had it happen to me that an operation of this kind was done and the piece removed examined in the laboratory, and absolutely no diseased tissue was found. However, this work is done and is destroying the confidence of the people in what is considered a complete operation. Of course, if any infected area remains, no matter where that might be, it is certainly possible to have the complications and secondary manifestations of infection throughout the general system, and yet, though a number of cases have been reported by Dr. Loeb, there are certainly very few indeed to my way of observation. I think, of course, that we all try to do a very complete operation in every case, and with good technic that is certainly accomplished in ninety-five out of every hundred cases at least, the lymphoid tissue at the base of the tongue of those left, according to my observation, amounts to very little.

Dr. Thomas Hubbard, Toledo, Ohio: Study of the tonsillar fossa after enucleation of the tonsil, especially in cases that have had recurrent tonsillitis and perhaps with arthritic symptoms, will show that there are sometimes small fistulous tracts which are distinctly outside of the capsule of the tonsil and really involve the muscular layer.

I have in mind a throat in which there was perfect enucleation of the tonsil, and yet the patient returned several times and said that she was having recurrent attacks resembling those which she previously had. I was able to pass a probe into the fistulous tract which evidently led into the muscular tissue. There was no tonsillar tissue. It is probable that sometimes we leave one of the small fistulous tracts which have been part of the peritonsillar suppuration at some previous time. I would say that during these attacks this patient

had recurrence of the arthritic symptoms just the same as prior to enucleation.

Dr. J. Payson Clark, Boston, Mass.: There is one point in Dr. Halsted's paper which I would like to emphasize and that is the possible relation of unsuspected conditions of the teeth to general infection. For the past year or more I have insisted upon patients who have come to me with frequent sore throats, or with some symptoms of a general infection, or so-called rheumatic symptoms where they say they have a dead tooth in their mouth, I have insisted upon having X-ray taken of all dead teeth and I have been surprised at the number of cases in which a tooth giving no symptoms locally at all, was in very bad condition and treatment of that tooth at once relieved the general symptoms. I will not go into detail about the cases; it hardly seems worth while to take time for that.

In regard to Dr. Loeb's paper I think the appearance of apparent tonsillar tissue in the fossa after operation is sometimes surprising. I have been surprised once or twice and several of the cases I have been able to explain, where I was perfectly positive I removed the tonsil, casuple and all, where the capsule was perfectly smooth and the fossa quite empty after operation, and a year or more afterwards there has been an appearance of tonsil on one side or on both sides. My explanation was that some of the lymphoid tissue of Waldeyer's ring below the tonsil, in the healing process, has been drawn up into the region of the tonsil. The tissue drawn up differs from ordinary tonsillar tissue in that no crypts appear in it. I have never seen any inflammatory process in this pseudo tonsil, if I may use that term. I remember one case in which I removed the tonsils of a little girl and a year or so afterwards the child was not very well with no definite symptoms, and the mother took her to the family physician who looked at her throat and asked why she did not have the tonsils out. She said that Dr. Clark removed the tonsils a year or two ago. She brought the child in to me and there on the left side was a distinct little tonsil, and the only explanation I could make was that some of Waldeyer's ring had been drawn into the place of the tonsil. The child never had local symptoms, simply generally not well. She recovered completely under general treatment.

Several years ago in September, 1908, I reported before the New England Otological and Laryngological Society, the results of operations on the tonsils, of tonsillotomy, at the Massachusetts General Hospital. We sent out 595 postal cards and about 73 of the patients reported. That is about

the average in such cases.* In 60 cases the tonsil tissue was still visible; 20 of the cases gave a history of one or two attacks of sore throat since the operation. Of those attacks only 10 had been definitely determined upon to be tonsilitis; at least two-thirds of the cases of tonsillotomy had had no subsequent trouble. There were 12 cases of illness since the operation, but none of the cases of illness were of the kind to be attributed to any infection from the remains of tonsillar tissue. These cases were all children. I am not holding a brief for tonsillotomy, but those who are interested can get the results of this investigation in the Boston Medical & Surgical Journal, Sept. 24, 1908.

Dr. Henry L. Swain, New Haven, Conn.: The question of susceptibility of tissue is a thing that is exceedingly difficult to estimate. The fact that we don't have more knowledge of the return of tonsil tissue after enucleation I believe is due to the fact that in all our cases the individual is not as susceptible as is the case in those from whom we do hear. Perhaps that sounds like circumlocution. But certain cases show susceptibility; if you leave the slightest bit of tonsil tissue you get a report of sore throat and constitutional symptoms etc. In other cases you can leave three times as much tissue and there is no report, and that is because the people are not susceptible.

A year ago at this time in my town we suddenly had an epidemic of streptococcus sore throat due to milk infection. In all we had 120 cases limited almost entirely to the college students. I took a great deal of interest in looking into the question of the presence or absence of tonsils. Out of that group, there were between twenty and thirty cases who had had thorough removal of the tonsils, absolute tonsillectomy. Not one of you would have been dissatisfied with the results of the operation had you done it yourself. In these cases we sometimes get more trouble than in those in which there is an abundance of lymphoid tissue. The five cases which gave me the most trouble with abscess formation, edema of the larynx, and grave constitutional involvement were in those of complete tonsillectomy, done so as to protect the boys from infection while at college.

Now, no thorough study of the tonsillar fossa will fail to reveal that there are outside of the capsule of the usual mass of tonsil tissue, bits of lymphoid tissue which can under

* This series of cases was operated on by the guillotine and punch before the capsule operation had been adopted.

circumstances existing in an individual, rehabilitate themselves, and take on whatever condition, good or evil, the tonsil tissue may have. These remnants cannot always be removed at the the time of operation because they only become visible by a subsequent growth. There were a large number of these cases which had infection in the lateral column of the pharynx, a tissue, of course, which is just as much lymphoid tissue as the tonsils themselves. This showed that there is no method of operation that can always, every time, take out all the tissue which is liable to be infected. The deduction is perfectly reasonable and logical that such lymphoid tissue has some use and it is the attempt of that tissue to do whatever function it possesses which forces it to appear when not removable from the tonsil fossa where it of right belongs.

The probabilities of general infection such as Dr. Halsted speaks about is illustrated in a most interesting case I had recently where the patient had a simple sore throat and then developed general poisoning of the system from the effects of the inflammation. As a result of that he had a large boil and ulcer at the back of the neck which seemed to have a formation of membrane on it so that one might expect to find of pseudo-diphtheritic origin. His physicians were giving autogenous vaccines in large doses and everything was well carried out in every particular. Six weeks after the original sore throat he came down with another throat seizure in which he had swelling over four distinct strips of tissue which were covered by a false membrane. Cultures from this showed it to be streptococcus. The throat later slowly cleared up but, July 6, the sore on neck was still open, discharging, and the whole a mass of semi-necrotic tissue. No discoverable streptococcemia existed but white cells were abnormal and red count down to almost a million and a half, rising at times to two million.

Dr. Greenfield Sluder, St. Louis, Mo.: One feature has been omitted in connection with these cases. It is an interesting question all the way through, and that is the matter of peritonsillar infiltrate. The aftermath of the case, the future course of the case frequently is influenced by the infiltrate that was about the tonsil. That infiltrate seems to me to frequently take the part almost of the tonsil itself. I have seen it a few times and latterly I have seen a few cases in which the infiltrate behaved as the tonsil, begin with a sore throat and suppurate. The tonsil was perfectly enucleated and preserved in a bottle. I make it a practice in operating

upon cases to save the tonsils from every individual, and later on I frequently find that I possess a number of tonsils and capsules which are perfect, but as Dr. Clark has expressed it the lymphoid tissue of the base of the tongue has grown up into the fossa and looks very much like a tonsil. I agree with Dr. Clark in contradistinction to Dr. Swain's view. The peritonsillar infiltrate may, furthermore, hypertrophy and later on look like tonsil as if something had been left, unless very carefully inspected. With that end in view some three months ago in the presence of a very large infiltrate, I removed the tonsil with a guillotine and found something which looked like the tonsil still in the throat. I then took out infiltrate the size of the original tonsil. The infiltrate on the opposite side remained. Subsequently sore throat developed, and developed in the infiltrate that was left. The side from which the infiltrate was removed escaped.

Dr. Joseph L. Goodale, Boston, Mass.: I wish to call the attention of the members to a matter which is germane to the paper of Dr. Loeb. The recognition of it frequently enables one to avoid misjudging the results of operations. I will illustrate what I mean by relating a typical case. This is a child, brought in by its parents with a history of recurrent infection, or supposed infection of the nose and throat. Examination of the throat shows more or less adenoid, and some enlargement of the turbinate. Operation may have been done for the removal of the adenoids and the tonsils. This may, however, be non-essential so far as our duty in the matter is concerned. In the type to which I refer the system of the child is saturated with the various albumens of his diet. I found a certain number of cases of what may be called incompletely developed anaphylaxis, children who during the summer with outdoor life and largely a vegetable diet, are entirely well, but who during the winter months while in school in cold weather are given by the parents a larger amount of egg, milk cocoa and chocolate than the system can dispose of. That may bring about a condition simulating vasomotor rhinitis, with snuffing, blocking of the nose, and a tendency to taking cold. Those children may have their tonsils removed, or possibly a portion left, but before we should proceed to operation we should examine very carefully this question of proteid diet. We should see if the child is taking more milk than it is accustomed to in the summer, or an extra cup of cocoa, or an extra egg; I would suggest that any excess of

proteid, should be restricted and I am sure you will find that a certain percentage of these cases will lose their symptoms.

The snuffing and colds will disappear without another operation. There is no loss in weight from cutting down the proteids but a gain in weight and appetite, and other types of food are better relished than before.

Dr. Harmon Smith, New York City: I believe that nature requires a certain amount of lymphoid tissue in that region and just as we see often when we remove the soft palate for maligancy, the posterior tips of the turbinate hypertrophy to prevent regurgitation of food into the pharynx, so the remaining lymphoid tissue undertakes to carry on that element of protection which the tonsils previously upheld. I do not believe that, spontaneuously, tissue resembling the original tissue will spring up. I know of instances in which three or four times after the removal of the tonsils from childhood on up to puberty, where all observable evidence had been removed, there would recur islands of lymphoid tissue and around the islands would form a kind of capsule. I have now a young man under my care, a lawyer from Boston who was sent to me by a member of this Association, in whom part of the lymphoid tissue has recurred and I have removed it several times. There is no evidence of tonsillar tissue in the original tonsillar area, but posterior to the lateral pharyngeal wall a segregation of lymphoid tissue remains which has the form of the tonsil without the capsule. He has at times clinical symptoms resembling, in every way, acute follicular tonsillitis. I cut this hypertrophy down recently and do not know what will be the outcome.

If you remove tonsils and leave lymphoid tissue at the base of the tongue, in such infections as from milk, etc., the lyphoid tissue will be prone to tonsillitis just the same as the original tonsil.

I also know of a lady probably forty years of age who had her tonsils completely removed and yet later had all the symptoms of a follicular tonsillitis on the lateral pharyngeal wall. From my observation I find that there are cases where the tonsil has been removed and the capsule examined and yet the recurrence of tissue there simulates in all its characteristics the original lymphoid mass removed. So that I believe nature requires a certain amount of lymphoid tissue.

Dr. Hanau W. Loeb, St. Louis, Mo.: My report does not comprehend anything but the leaving of a portion of tonsillar tissue and does not refer to cases in which the recurrence of symptoms depends on the development of additional

lymphoid tissue. I don't think like my friend Dr. Smith that nature is there with a club and forces a certain amount of lymphoid tissue. Nor was I speaking of the recurrence of tonsillar tissue which in my practice I have never observed, but I am speaking of the actual leaving of portions of the tonsil in some instances by myself, and in some instances by operators more competent than myself. I am sure that if operators will examine their cases, one, two and three months after operation they will find that not infrequently a small mass of tonsillar tissue remains. It so happens that in two instances I was able to verify the fact that I had left a portion of the tonsillar tissue there, because I had the tonsil in a bottle and a careful examination of the capsule revealed a very minute portion that was left.

With reference to the inclusion of some tonsil tissue in the scar, I feel at least in one particular case I reported that the inclusion was there before the scar; in other words, I left a mass there and the scar covered it over, that case in which there was a minute abscess in a little crypt. That patient had several attacks of appendicitis which went on to operation, and I feel the little piece I left there may have been responsible.

We should not hesitate to let people know when we have done an incomplete operation. This is better than having an acute infection come on and someone else tell the patient. I do think we ought to protect ourselves in that respect. I for one never hesitate to tell the father and mother of a child that I have left a small portion of the tonsil. Of course years ago that was fairly common, but I am thankful to say it is uncommon now.

I wanted to bring the matter up to the Association as an argument not for tonsillectomy, but for complete tonsillectomy and also to assert that the mere statement that an operator is going to do a tonsillectomy does not signify that he is doing or has really done a complete tonsillectomy operation.

# THREE BRONSCOSCOPIC CASES OF DENTISTS' ORIGIN

B. R. SHURLY, M.D.

In a series of bronchoscopic cases that have come under my observation a number of exceedingly interesting developments have arisen from accidents which have occurred to dentists in the ordinary routine of their office practice.

The three cases which I have to report of personal observation in one city, might indicate that the possibilities of disaster in ordinary dental proeedure were sufficiently great to inaugurate some preventive measures of additional safety.

As these three cases occurred during the last decade in a city of an average population during this time of 500,000 people, and as we have an estimated population of over 100,000,000 it might be fair to eonclude that possibly 600 cases of similar accident had occurred in the United States and Canada perhaps, during a similar period. It might therefore be of importance to devise a speeial protective device to prevent the sudden inhalation of foreign bodies during dental proeedure.

Again the question of the medico-legal problem with questions of responsibility as to whether these accidents involve ordinary care in dental proeedure, might be of interest although exceedingly delieate ground to tread upon, as one of these eases involved a very considerable law-suit and the other two were allowed to pass with nothing more than an attempt to collect the surgeon's fees from the dentist. The medico-legal possibilities did not come to actual trial.

The fact that two of these cases were not discovered by the dentist or the patient at the time of operation, might possibly indicate the neeessity for some detailed method of observation and counting in the extraction of teeth, similar to that provided by the abdominal surgeon in the case of sponges and instruments.

The peculiar relationship of laryngology and clinical medicine and its great importance, one to the other, was again illustrated by the fact that two of these cases first came under my observation as referred cases for clinical examination of the throat and chest on account of long, persistent cough which simulated pulmonary tuberculosis.

It is of course, fashionable at the present time to consider and many times prove a persistent cough as necessarily of tuberculous origin, and many cases of broncho pulmonitis with different etiologic factors are overlooked in the furor of the tuberculosis campaign. It is of sufficient importance therefore to at least consider in the ordinary chest diagnosis, the question of foreign bodies or lung abscess.

Miss S., in 1909 consulted Dr. Hickey for a cough which she stated had been bothering her for a period of about six months. During this time she had consulted several physicians and had taken a variety of cough remedies.

In obtaining a history of the case we found that she was quite decided in her statement that the cough came on immediately after the extraction of a tooth under gas anesthesia. Accordingly a radiogram was taken which showed the opaque shadow apparently of a broken tooth in the second division of the right bronchus. The dentist who had performed the extraction was informed and after consultation, the consent of the patient was obtained for an attempt of its removal.

The patient was given ether anesthesia and bronchoscopy was attempted. At this time, cocainization of the trachea was not practiced and the attempt was unsuccessful on account of the severe coughing of the patient. A week later, tracheotomy was performed, and a bronchoscope introduced through the tracheotomy wound; after some searching, the tooth was found and easily removed. There was no extra secretion in the bronchus containing the tooth and no appearance of irritation from the foreign body. An interesting fact about the radiogram which we had taken before the operation was the appearance of the left diaphragm. The right diaphragm was found to be hazy in its outline, while the left diaphragm was

clear cut. This was explained on the theory that the right diaphragm was in a state of spasm owing to the irritation of the foreign body. The attacks of cough of which the patient complained were of a paroxysmal type. The tooth on examination was found with a badly decayed crown with one root attached.

2. Mrs. G., age 38, was referred to me October 22, 1912, for observation and diagnosis in regard to a particularly persistent and annoying cough which failed to respond to large doses of codeine and heroin. The patient's cough began directly after taking nitrous oxide and the extraction of a tooth. This persistent cough was attended by well marked symptoms of emaciation, increased nervousness, loss of weight, localized pain over the right chest and each exhalation was attended by a marked odor of rubber. The patient complained particularly of being unable to get away from this odor of rubber, night or day. A probable diagnosis of foreign body in the right bronchus together with its location was well marked and comparatively easy in this particular case, from the physical signs alone, as the air supply of this immediate region and division of the bronchus below the foreign body, was decidedly cut off. This probable diagnosis was immediately confirmed by the X-ray examination which located a square apparently of hard rubber which had been part of a dental mouth-gag, in the second division of the right bronchus, resting in a lateral position.

This patient was put under ether and a prolonged search was made, finally bringing the foreign body into view, it was grasped by the forceps, pulled and brought up to the trachea, when in some manner it was lost, and although another prolonged search was made, the bronchi were filled with secretion and it was impossible to find the foreign body again. After consultation with Dr. Hickey and others who assisted me, it was decided that it was better to make a further attempt in the near future, and the patient was returned to her room. A few minutes later our discouragement and chagrin was quickly turned to joy by the nurse rushing to me with the foreign body in a pus basin, as it had been coughed out on her

partial return to consciousness. The patient made an uneventful recovery. An examination of her chest recently revealed no permanent injury.

3. Mr. L. W. B., age 49, architect by profession, was receiving treatment from a dentist preparatory to filling a tooth. The cavity was treated with a dental burr which in this particular case was held between the thumb and forefinger during the process of application. This tiny instrument suddenly slipped and was inspirated into a lower division of the left bronchus. After this remained in the bronchus for ten days, the patient was sent from his home in the central part of the State of Michigan, to the Detroit Eye, Ear, Nose and Throat Hospital. The X-ray examination reported—Antero-posterior and lateral plates were made of the chest. We find a shadow in the lower left thoracic region, which we think should be interpreted as a metallic foreign body in the lower left bronchus. After a thorough cocainization with novocaine, of the respiratory passages, with cocainization advanced as the tube was introduced and followed to within the lowest terminations possible and assisted by Dr. Hickey, I was able to extract this foreign body, which was pointing with the needle part upward. The patient recovered completely without symptoms.

## Discussion

Dr. Thomas Hubbard, Toledo, Ohio: It certainly seems that the position of the patient's head in the dental chair is very conducive to the entrance of a foreign body into the throat or air passages. Fortunately, most of them go into the gastro-intestinal tract.

A case comes to mind in which a tooth was lost and remained in for several years and was then spontaneously expelled. The patient was not very ill any of the time and finally expelled the tooth spontaneously. There are many of these cases unrecorded.

Another case is that of a woman who carried a fragment of Allen's dental cement, which is quite as firm as a tooth structure, in her left lung for seven months and during that time had all the symptoms of advanced tuberculosis. There was a large abscess cavity and in it was found the fragment of cement. She made a perfect recovery. This brings up the question, as raised in this case, as to the legal complications which are liable to

come up. In justice to the dental profession I believe we should take them into our confidenee in all cases of liability on the part of the dentist, and the dentist should be present at the operation. This relieves us of charges of unfair treatment toward the dentist.

Dr. Harmon Smith, New York City: I wish to call attention to a case more or less similar to the third case mentioned by Dr. Shurly. The patient was one of our wealthiest men who was having his back upper molar tooth drilled by a burr as represented in his third ease. The dentist dropped the burr while the patient was in a semi-recumbent position with his head backward and drawn to one side. He turned to take up a pair of forceps and when he went to find the burr, it was gone. He became alarmed and told the patient to have an X-Ray taken. The gentleman felt no inconvenience, and instead of that went to a board meeting downtown and in due course of the day had the X-Ray picture taken. It showed the burr in the upper left lobe, and the patient was then taken to the General Memorial Hospital. There he was bronchoscoped, and the bronchoscopist called in attempted to remove it. He tried for a while and did not succeed and asked me to come up. I failed and we decided then to have one of the best men in the country come on, Dr. Jackson; in the meantime another gentleman in town was suggested and he came and failed. In due course Dr. Jackson came on and he had both anterior and lateral fluoroscopic views to see exactly where the foreign body was located, but finally put it down as a case in which it was impossible to obtain the foreign body. It had been lodged in the upper outer lobe of the lung. It was recommended by the surgeons that part of the lung should be removed, but the gentleman succumbed to the operation. The burr, however, was obtained.

I cite this only to show how dangerously and frequently these cases occur.

In reply to a question by Dr. Thomas Hubbard as to whether any of these reports were collected in the dental journals and as to whether Dr. Smith had any knowledge of dentists taking cognizance of them and making special reports of the bronchoscope in dental accident cases, Dr. Smith replied that this was not done so far as he knew.

Dr. Albert C. Getchell, Worcester, Mass.: I will add two cases to Dr. Shurly's—one following extraction of a tooth under ether. The patient was operated upon and recovered, and the bill was paid by the society by whom the dentist was insured.

The second case was a patient seen recently with a cough following immediately upon extraction of a tooth. This patient developed lung abscess, was operated upon and recovered, and then had a recurrence of the abscess.

Dr. Carl E. Munger, Waterbury, Conn.: I know of a case in which a dental burr was lost and the fluoroscopic view showed it just below the vocal cords. Tracheotomy was done and no dental burr was found. I should say that during the administration of the ether there was a good deal of struggling on the part of the patient and probably the burr was coughed up and lodged in the naso-pharynx, as next morning the patient found something in his mouth and spit it out. It was the dental burr. In this case the dentist paid the bill.

Dr. Bryson Delavan, New York City. I am glad Dr. Shurly has brought up his timely contribution to this subject. I was familiar with the case reported by Dr. Harmon Smith. The thing which impressed me most with regard to it was the futility, as a general rule, of the immediate application of the radical operation for the removal of a foreign body from the lung. Unless the bronchoscope will succeed in removing the foreign body, the patient's chances of life are better if time is given before placing him in the hands of the surgeon. Operation for the removal of the foreign body performed at once has seldom been successful, while delay has often resulted in recovery.

Dr. Emil Mayer, New York City: I recall the case of a gold crown of a wisdom tooth which was inhaled by a patient. With the valuable help of our new member, Dr. Arrowsmith, I was able to remove this successfully. The case occurred about two years ago. One interesting point in regard to that case was that the anesthesia was rectal, which prevented anything like a struggle on the part of the patient, thus possibly dislocating the foreign body, and another point of interest was that as I removed the gold crowned tooth Dr. Arrowsmith was standing guard over the patient with a pair of forceps in his hand and as that large crown was brought into the mouth and slipped Dr. Arrowsmith promptly grabbed it and brought it out.

Dr. Robert C. Lynch, New Orleans, La.: I would call attention to the case of a lady who was having a set of false teeth made and the dentist was using plaster of Paris as for modeling. He put in a cup filled with plaster of Paris and pushed it up at the same time forcing her head back, and the plaster of Paris went down into her trachea. This was five years before I saw

her and made a bronchoscopic examination. I removed nine pieces of plaster of Paris from both lungs. I also found at that time a very marked constriction of the bronchials and these I dilated.

Dr. Stanton A. Friedberg: I would like to add several somewhat similar cases to those under discussion. These accidents, as a rule, are not reported by dentists. They may be classified first, as those that occur at the time of operation, and second, those that occur from insufficient or loosely attached crowns or bridges.

I recall one case the history of which is practically the same as Dr. Shurly mentioned in one of his cases, namely, cough coming on immediately after recovery from anesthesia for the extraction of a tooth. The cough with expectoration persisted for a number of months and the patient was sent to Colorado for climatic treatment. While there a radiograph of the chest was made which showed the presence of a tooth in the lower part of the right lung near the border of the sternum. The patient returned to Chicago and came under my observation. There was a small abscess cavity with definite physical findings present. The tooth was removed by upper bronchoscopy but the abscess persisted for a long time afterwards.

Another case was that of a man who in an intoxicated stupor aspirated a bridge consisting of three teeth. Physical findings and the radiograph localized the foreign body in the left main bronchus. On attempting to cocainize the larynx hemorrhage from the lung ensued. The tube was introduced but on account of the blood it was impossible to see anything. A second attempt later also brought on hemorrhage as soon as cocainization was started but in spite of the bleeding the tube was introduced and the bridge removed by fluoroscopic bronchoscopy.

In the third case, that of an aspirated dental broach, upper bronchoscopy could not be done on account of the inability of the patient to open his mouth. In consultation with his surgeon, inasmuch as his symptoms were not acute, we decided not to do a tracheotomy but to wait until the swelling about the jaw subsided. On account of the fine point of the broach the patient was advised to refrain as much as possible from coughing. Fortunately for him, however, the broach was coughed out several days later.

Dr. John F. Barnhill, Indianapolis, Ind.: I wish to speak of an accident on the part of a rhinologist. Five years ago someone in Indiana consulted me concerning his daughter who lived in

New Jersey. She said she had had some sort of nasal operation and on the way home got asthma, and he wished to know what could be done. I suggested that possibly some foreign body had gotten into her larynx or trachea. Later he consulted me again and I requested that he consult Dr. Jackson. She started to Pittsburgh and on the way coughed out a complete turbinated body that had in some way been inhaled during this operation.

Dr. Burt R. Shurly, Detroit, Mich. (closing discussion): I have nothing more to add except to emphasize the fact that there are really a great many of these cases, apparently. If we got them all together there would undoubtedly be a certain number of cases of lung abscess, the details of which have not been properly looked into, which would be proven to be of foreign body origin.

# REMOVAL OF FOREIGN BODIES FROM THE LARYNX, DISPROVING PREVIOUSLY MADE DIAGNOSES

HILL HASTINGS, M.D.

The rapidly growing use of direct laryngoscopy is showing up many incorrect diagnoses, especially in children, where foreign bodies were found in the larynx and trachea. The increasing number of them makes one feel that it is worth while to report all such cases. The accumulation of reports of this kind is unquestionably arousing the general medical profession's attention to the possibility of foreign body impaction in babies who are supposed to have "croup," "thymic asthma," and other obstructive conditions. A fear that we have met with in handling babies with obstructed breathing is the feeling that fatal asphyxia will occur during direct laryngoscopy, or subsequently after removal of the foreign body, from odema of the glottis. A preliminary tracheotomy is therefore often urged by the family physician, and many of us who are aware of our own lack of skill will often be rather willingly persuaded to do a tracheotomy before attempting the removal of foreign bodies in babies.

I would like to present a report of two cases (both babies), with incorrect diagnoses in which foreign bodies were found impacted in the larynx.

Baby L.—age 17 months, had been sick for a week with "croup" with gradually increasing obstruction to breathing. The father, a physician, and a brother practitioner had been treating the patient with the feeling that the trouble was "croup," with slight bronchitis. No diphtheritic membrane had been seen in the throat and cultures from the secretion had been negative for diphtheria. There had been slight respiratory obstruction and a little fever—100.6° the highest. The baby was asleep in bed at the time of our consultation and was breathing with audible roughness, but without cyanosis and without any considerable difficulty. The possibility

of foreign body impaction was suggested, whereupon the father said that he dated the trouble to a little choking spell which the child had had when fed some soft boiled egg; but that the child had not really suffered much until two or three days later when the increasing croupy cough and cry and a little fever made him disregard the choking event. On waking the child its crying increased the dyspnea and brought on some cyanosis, which subsided quickly when the child again became quiet. Indirect laryngoscopy was a failure. The father preferred to await the result of X-Ray examinations and the use of simple therapeutical measures before allowing direct laryngoscopical examination. The X-Ray examination was negative. The child's obstruction grew gradually worse and direct laryngoscopical examination was agreed to. After a consideration of the danger of operating without a preliminary tracheotomy it was finally decided to do a tracheotomy. With the use of Jackson's small-sized laryngeal speculum a piece of egg-shell was found embedded in the larynx, between the cords, protruding into the glottis, giving very much the same picture as is shown in the drawing in Dr. Jackson's book on a similar case. There was considerable odema of both vocal cords and bands and some purulent secretion. The egg-shell was easily removed. Convalescence was uneventful. The tracheotomy tube was not removed for three or four days because of the difficulty in breathing that resulted on attempts to do without it, which supported the contention that a preliminary tracheotomy was advisable.

The history of the second case was rather indefinite. Baby W.—16 months old, was hurriedly brought from the country to the California Hospital because of great dyspnea. The child was already on the operating table when I first saw it. Tracheotomy instruments had been prepared. The dyspnea was severe. There was enormous distention of the anterior chest wall, marked during efforts of inspiration, but also pronounced during both inspiration and expiration. This chest-wall distention was so great that a large growth of the mediastinum had been suspected. Both lungs were distended. There was a generalized bronchitis, and a temperature of 104°.

There was alarming cyanosis and the patient was almost unconscious. The only history obtained was that the illness dated back 15 days to a choking spell that occurred while the child was sucking a piece of mutton-chop bone. The parents were poor and ignorant and lived in the country away from medical aid and did not realize for several days the gravity of the trouble. One of their local physicians, called in after the child had become very sick, had suspected a growth in the chest, or a mediastinal abscess. No X-Ray examination had been made.

Foreign body impaction was at once suspected. Immediate tracheotomy was done without any anesthetic. The patient was practically unconscious from the deep cyanosis. On opening the trachea immediate relief was obtained and the acute pigeon-breast, tumor-like appearance at once disappeared The end of a piece of bone was felt at the tracheal opening. The bone, rather firmly impacted above in the larynx, was removed by forceps. It was a large rather thick sliver, about one inch long, sharp at its upper end. The child's fever and considerable purulent discharge and cough continued for a few days. Recovery was complete and the patient was discharged on the 16th day.

### Discussion

Dr. John F. Barnhill, Indianapolis, Ind.: I have seen two similar cases. One in a child that had been treated for about four days. This child had a safety pin just below the larynx up side down. Tracheotomy was done with easy removal of the pin. Complete recovery followed.

Another child, thirteen months old with exactly such a history and in such a condition as the doctor described in his paper. The child was treated, as I remember, by four different physicians, all for croup. One believed the child had asthma. The X-ray showed a safety pin just below the larynx which was easily removed by tracheotomy.

Dr. Harmon Smith, New York City: A case comes to mind of a patient six years of age treated by six different doctors. It was treated for diphtheria and had antitoxins, had intubation done on two different occasions, and the child was finally sent to me by a prominent nose and throat specialist to remove a papilloma of the larynx. So I prepared, on his diagnosis,

for such removal. As I was proceeding to remove it I saw the tip end of a safety pin lodged in the anterior commissure wedged between the two vocal cords. After removing it there was no further trouble.

Dr. Thomas Halsted, Syracuse, N. Y.: I had a case which was more or less similar to the egg shell case. My little patient, about a year old, was also treated for diphtheria and had antitoxin for two or three weeks before I saw the case. A diagnosis of a probable foreign body was made. Tracheotomy was done and three pieces of egg shell were removed and the child recovered. This was before the days of bronchoscopy.

Since the age of bronchoscopy I have had two cases of children each eight months of age, one in which we found a fish bone just below the vocal cords which was removed, and the other in which a spicule of glass was found but which was not removed. We got hold of it, but it slipped the forceps—and was swallowed—the child recovering.

As long as fifteen years ago I reported seven cases of foreign bodies in the lower respiratory tract in children, all between two and three years of age and all occurring in a period of two and a half years. Recovery of the foreign bodies in these seven cases took place by means of tracheotomy and their removal with forceps introduced in the trachea, and in several cases into the bronchus, while some of the foreign bodies were coughed through the tracheal opening. Six of the seven children made a good recovery, while one died of pneumonia.

# VINCENT'S ANGINA

THOMAS HUBBARD, M.D.

The term ulcero-membranous tonsillitis is not comprehensive enough to displace the term Vincent's angina. The most serious type is not confined to the tonsils.

The disease, described first by Plaut and Vincent in 1894, is very gradually assuming a place in our clinical studies. Admirable papers have been published, notably by Mayer (Am. Jour. Med. Sci., 1902), Halstead (Lar., Dec., 1912). Levy (Lar., June, 1913), Stark of El Paso, Ira Frank and others, but the disease is still regarded rather as a pathologic *curio* than a common type of throat infection. It is worthy of remark that so many of the clinical articles are reports of very serious or fatal cases. This group of fatalities, in a disease that is usually transient and curable, and taking into consideration the rather scanty literature, arouses the suspicion that a large number of cases are not diagnosed. In fact I can recall several in my own practice which I now conclude were of the Vincent's angina type, and personal reports from other physicians confirm this impression. In other words, laboratory study of all ulcers and false membranes is necessary to positive, timely diagnosis.

Spirillar infections are common in the mouth and throat and there are undoubtedly different types varying in pathologic virulence. The spirochete of syphilis is a protozoon and probably this is true of the spirillum found associated with the fusiform bacillus in Vincent's angina. If this be verified, spirilli and fusiform bacilli may not be transmutation forms, and on this question bacteriologists have not given the final decision. As stated, the experienced laboratory worker can differentiate between the *spirillum buccalis*, the *S. dentium* and the *S. pallida* by the dark field condensor. And further, in all well developed cases of Vincent's angina the diagnosis is aided by the abundant number of spirilli and fusiform bacilli to be

found if searched for properly. If not discovered in the false membrane, scrapings from crypts and granulation tissue should be tried. Mouth, and particularly alveolar ulcers, show spirilli of a coarse variety as well as fusiform bacilli, and it does require some study and experience to eliminate this common type in making a diagnosis.

The range of pathologic lesions attributed to the Vincent's group includes the pseudo-membranous tonsillitis or pharyngitis and ulcerative tonsillitis and also the malignant type as found in canerum oris or "noma" (De Sanctis, N. Y. Med. Jour., Mar. 6, 1915). The disease process may invade the nasopharynx or hypopharynx and larynx and also the esophagus. Cervical adenitis and phlegmonous cellulitis may develop with more or less sepsis. In fact Vincent's angina can cause a rude awakening about as shocking as any disease that I know of and it is a good thing to have a plan of attack all thought out beforehand, lest one be guilty of neglect of proper treatment, ill-timed overdosage with diphtheria antitoxin or convicting antisyphilitic medication. Some Vincent's angina throats so resemble diphtheria that one is tempted to ignore the negative Klebs-Loeffler findings and waste precious time on serum, but probably the most common error is to resort to mercurials or the arsenical group and perhaps condemn the victim on the resulting therapeutic diagnosis. The arsenical group is destined to play a more and more important role in specific therapy and unless extraordinary care in diagnosis be taken, some Vincent's angina cases will be labelled syphilitic because certain local throat symptoms melt away under the salvarsan treatment.

The study of spirillar types of infection is developing. There is a considerable variety and such diseases as: African fever, relapsing fever, and Yaws have already been added to syphilis and Vincent's angina. The universal use of spirocheticides will ultimately determine the therapeutic range of the mercurial and arsenical group, and again I say, depend on laboratory findings to avoid confusion of identity of the spirillar throat infections. Don't conclude that a man has syphilis because the

throat ulcer or pseudo-membranous formation clears up under salvarsan until you have excluded Vincent's angina.

Levy has recorded a case resembling Vincent's angina in which it was impossible to determine the true nature of the throat lesion until secondary symptoms, developed with positive Wasserman. It would seem, however, that study under the dark field condensor should enable the expert to differentiate between the spirillum of Vincent and *S. pallida*. The necessity of careful study of all of these obscure cases is further emphasized by the strong probability that the arsenical group of spirocheticides exhibits a specific action in Vincent's angina quite comparable to the specific action in syphilis. There is not yet sufficient clinical data to verify this statement, but it is rational and cases so far reported warrant thorough trial of this treatment.

And there is still another link in this chain that must be forged. Does Vincent's angina with marked systematic symptoms affect the Wasserman reaction? I cannot learn of any positive data bearing on this question. One case herein reported gave a negative reaction during acute symptoms and one two months after the attack of Vincent's angina. To settle this question many cases should be examined during acute, severe angina exhibiting the characteristic sepsis. The spirilli and fusiform bacilli are anerobic and, as would be expected, are usually found associated with the cocci prevalent in all throat infections. Precisely the reciprocal role that each plays cannot as yet be determined. The pathologic process may be that of more or less extensive pseudo-membranous formation or deep coagulation necrosis. The latter process, characteristic of anerobic bacilli, may progress beneath an apparently normal tonsillar surface. I have seen a case of Vincent's angina in a young man having large, spongy tonsils, progressing daily to a condition of sublingual edema with extensive cervical adenitis and sepsis, in which one tonsil showed the ordinary pseudo-membranous deposit and the other looked like parenchymatous tonsillitis. It was not until the surface tissue collapsed into the excavation that I realized the extent of the necrosis and cause of the

sepsis. This accounts for the futility of local application in the ulcerative type.

The disease is naturally self-limited but occasionally it lasts for weeks, and deep cicatrices are the evidences of the extent of destruction, often involving muscular tissue. One fatal case, an adult, a strong, vigorous man, had an ulcerative process that involved the tissues behind the tonsil, exposing the angle of the jaw and finally a large blood vessel was eroded. (This was prior to the discovery of salvarsan.) Local treatment was useless. Extraction of several teeth, curettement, and application of escharotics failed to check the necrosis. Microscopical study of the scrapings and sections of the removed tissue confirmed the diagnosis of Vincent's angina.

Febrile reaction and sepsis is usually manifested about in proportion to the degree of cervical adenitis. These symptoms and, in fact, the malignancy of the disease, may be determined by the degree of mixed infection. In other words an instance of exaltation of virulence.

The fact that the patient has another disease in which throat infections are usual, such as the exanthemata or even a peritonsillar abscess, does not exclude Vincent's angina. Ira Frank reports a case of the latter type and Halstead concludes that some of the chronic ulcerations and pseudo-membranous conditions labelled diphtheria or scarlatina are probably Vincent's angina. More dependence on laboratory diagnosis would clear up some of these cases. I can recall such a case of supposed post-scarlatinal ulceration in the tonsillar fossae which was probably due to spirillar infection.

### *Treatment*

Stark of El Paso calls attention to perborate of sodium as an efficacious local medicament. The nascent hydrogen dioxide penetrates and disintegrates necrotic tissue and is, theoretically, an ideal inhibitor of anerobic bacterial growth. Perborate of sodium is a constituent of the foaming dental powders and has stood this empirical test with credit. *S. buccalis* and *S. dentium* are present in pyorrhea alveolaris and here

hydrogen dioxide is particularly indicated. It is less of an irritant to the normal tissue and incidentally I can recommend it in all pseudo-membranous forms of throat diseases where peroxide of hydrogen is commonly used.

I have tried most of the antiseptic throat medications and must conclude that in the ulcerative necrotic type involving spongy tonsils they are unsatisfactory; and the objection to strong antiseptics is that we are liable gradually to extend the area of invasion by destroying normal marginal tissue. Goodale has particularly cautioned against this practice in throat infections. This applies also to throat washes of all kinds. The local treatment resolves itself into careful applications *limited to the diseased tissue.* The iodo glycerole (iodide of zinc 2, iodine 3; aq. dest. 5; glyc. 10.—Jour. A. M. A., Aug. 3, 1912), applied to the tonsil crypts, is probably the most efficacious antiseptic. This, by the way, is another find by a dentist, Dr. Talbot of Chicago. It has long been used in pyorrhea alveolaris. It is the most penetrating iodine preparation that I have had experience with and of a consistency that enables one to limit the spreading to the sound marginal area.

To sum up the local treatment advocated; powdered perborate of sodium rubbed into crypts and necrotic tissue—a saline gargle to remove debris—and iodo glycerole (Talbot) swabbed into all recesses with extraordinary care to protect the margin of normal tissue.

The majority of cases will yield to this treatment, repeated of course at proper intervals, but occasionally we will encounter the malignant type characterized by progressive necrosis in all directions and rarely, it must be remembered, invading inaccessible regions such as the lower respiratory tract and esophagus. I have not seen record of involvement of nasopharynx, but probably is occurs, hidden by the swollen velum and tonsils.

This naturally leads up to consideration of systemic treatment and fortunately we have something apparently dependable in this line. Theoretically the arsenical group is specific in action and I think that experience is proving favorable.

Take this type of the disease. A young man of twenty having large tonsils presented a throat that was so strongly suggestive of syphilis that a Wasserman was indicated. One tonsil was covered with necrotic false membrane, and the other enormously swollen and general cervical adenitis was in evidence. Blood test negative, and local treatment for several days made no impression on the disease. The sublingual tissues became edematous, threatening Ludwig's angina. The collapse of the swollen tonsil surface into the necrosed fossa explained the cause of progress of the local and progressive sepsis. He was given hypo. of cacodylate of sodium (3 gr.) two doses in two days and the improvement in the local condition was noticeable in forty-eight hours. The sublingual edema subsided and tissues cleared up precisely as a syphilitic lesion melts away under mercurials and there was little or no indication for local treatment after three days. The throat healed with deep cicatricial evidence of true necrosis. One tonsil was more than half destroyed. This case, and several others observed in my own practice and seen in consultation, rather convinced me that this treatment, cac. sod. 2½ to 5 gr. repeated next day (if urine normal) is rational and probably it is good practice to try this out in all severe cases that do not yield promptly to the local treatment outlined.

There are cases, however, which need salvarsan intravenously to effectually check the ravages of the spirilli and associated germs. A case of this type. A young woman of a clean health record developed tonsillitis with a nasty foul exudate. The tonsils, seen prior to illness, were no larger than small almonds and had small crypts. They swelled enormously, filling the throat and the odor became intolerably bad. Smears and cultures negative to diphtheria bacilli (three times), and positive as to the Vincent's organisms. Smears showed presence of spirillar and fusiform bacilli, abundant and in almost pure culture in granulations and exudates from both tonsils. Local treatment over a period of several days was without effect. She was becoming septic and half starved. Cervical glands, anterior and posterior, enlarging and tender. The characteristic odor permeated the room and I was strongly

tempted to ignore the negative diphtheria findings and give diphtheria antitoxin. The caeodylate of sodium had been given and two doses made no impression on the disease, more serious septic symptoms were developing; fever, prostration and feeble heart action; pulse 85 and mounting to 130 on slight exertion. Dr. W. J. Stone saw the case with me and neo-salvarsan 0,6 gram (equal to 0,4 gram salvarsan) was given intravenously. Weight 120 lbs. The reaction was quite alarming, temperature 105, chills, and some nausea, moderate delirium lasting 18 hours. There followed a phenomenal subsidence of all throat symptoms. The left tonsil was found to be destroyed almost to the capsule and the right to less degree; all necrotic tissue sloughed away in a few days. The urine contained albumen and the patient was very weak for some time. In less than a week the throat was almost normal but the patient made a slow recovery from the general septic shock. Two months later Dr. Stone made the Wasserman test just to verify our diagnosis and, as suspected, it was negative. Four months later I enucleated the tonsils under general anesthesia and on section of tissue no spirilli were found.

It happened that Dr. Stone had a short time previous to this experience a fatal case of this type of angina in a young pregnant woman in whom a simple pyorrhea alveolaris gradually developed into a septic phlegmon of the lower jaw and sublingual tissue—a horrible death from sepsis, and strangulation. The case detailed above presented a hopeless condition prior to the administration of neo-salvarsan. The improvement following was comparable only to that which we see in diphtheria cases following a proper dose of antitoxin.

Specificity of salvarsan and neo-salvarsan in all spirillar infections is highly probable but a considerable number of cases must be observed before a positive opinion can be ventured.

In conclusion I would emphasize the following:

Pseudo-membranous and ulcerative angina should be studied in the laboratory for the purpose of differentiating between diphtheria, syphilis and Vincent's angina. In doubtful cases the dark field condensor will aid in distinguishing the spiril-

lum of Vincent from the *S. buccalis*, the *S. dentium*, and the *S. pallida*.

Local treatment of Vincent's angina recommended is perborate of sodium in powder, a mild non-irritating gargle like Dobell's solution, and iodo glycerole applied only to necrotic or false membrane areas. In cases that do not yield promptly to this treatment cacodylate of sodium 2½ to 5 gr. repeated in 24 or 48 hours (if kidneys are not affected). In the malignant type, not improving under the above treatments, give neo-salvarsan 0.6 grm. (average body weight adult) intravenously.

## Discussion

Dr. Emil Mayer, New York City: I would like to take some exception to the originality of the use of glyceride of iodine. When I first called attention to this affection we know so well now, I then spoke of the use of iodine and at that time was using iodine, iodide of potassium and glycerine as a local application. I have since learned to know the tremendously valuable effect of salvarsan, either injected intravenously or applied locally.

A very short while ago a patient presented himself at the Mt. Sinai Hospital, New York City, with a very large ulceration at the under surface of the tongue that had been existing for a couple of months due to the spirillum of Vincent. A local application of salvarsan with an intravenous injection, the Wassermann having first been proven negative, resulted in a cure within forty-eight hours. I would like, however, to see some of the results from the application of the salvarsan locally without the intravenous injection. It is very possible, indeed, that the application itself would do all that we would require, and the patient might not even require an injection, but it does not mean by any means that because a patient has recovered that that patient has had syphilis, but that this arsenical preparation has a beneficial effect on the treatment and cure of this disease.

Dr. Thomas Halsted, Syracuse, N. Y.: About a year ago a physician consulted me with the statement that for six weeks he had had a severe tonsillitis. He contracted this, apparently, from a school teacher with whom he had danced and who developed the next day, a Vincent's angina, of which she died ten days later. The doctor was seen by a number

of specialists, but the diagnosis was not made and he finally came to me. I found a deep ulceration of both tonsils and an extensive cervical adenitis. The microscope proved the ulceration to be Vincent's angina. A short time before my attention had been called by a general practitioner to the possible use of enesol in the treatment of Vincent's angina, enesol being a perparation of arsenate of mercury, which originated in France. We used enesol hypodermatically and did nothing else. There was no local treatment whatever not even a mouth wash for 48 hours. The improvement at the end of 24 hours was marked and at the end of six days during which time three treatments had been given, the ulceration was perfectly healed. I have never seen even a mild Vincent's angina clear up so quickly, and this was an unusually severe case.

Since that time I have treated six cases in the same way with enesol. I simply want to call attention to this treatment as I believe it is a great improvement over the use of salvarsan in that it is much simpler in application, and there have been no reactions in any of the cases, following the administration of the drug.

Dr. Thomas Hubbard, Toledo, Ohio. (Closing Discussion): Dr. Mayer mentioned the use of iodine. Iodoglycerole is composed of iodine of zinc (2), iodine (3), glycerine (10), and water (5). I think that it is more penetrating than the ordinary iodine-glycerine preparations.

As to the choice of the arsenical preparations, I think that is a question for clinical proof, and Dr. Halsted's report verifies the statement that the use of some member of the arsenical group is a dependable treatment for Vincent's type of infection.

# SERIAL FROZEN SECTIONS OF THE THORAX, FROM A CASE OF ANEURISM OF THE AORTIC ARCH

GEORGE FETTEROLF, M.D., SC.D., AND GEORGE W. NORRIS, M.D.

Twenty, or possibly even ten, years ago there would have been little or no justification for presenting this paper before such a gathering as the present one. However, the gradual extension of laryngologic activities into the regions adjacent to the nose and throat have so widened our field of interest that I feel that no apology is called for in presenting this case to you. So frequently do men in our special line of work introduce instruments into the thorax and so well is the normal anatomy of this region known, that it occurred to me that a graphic presentation of a case in which the usual relations are badly distorted by disease might be of interest and profit. Along with the slides depicting the details of this case will be shown those of a few sections of chests which are normal or nearly so, in order to emphasize the abnormal conditions of our own case.

I will present first a very brief abstract of the patient's history. (The full history of this case can be found in the Transactions of the Association of American Physicians for 1917.) He was in the Pennsylvania Hospital twice, once in the service of Dr. J. Norman Henry and once in the service of Dr. Arthur Newlin.

W. F., negro, age 40 years, stevedore by occupation. Fifteen years previous to his death he had had a double infection, Neisserian and luetic. Two years before his death he noticed a bulging in the upper sternal region, which gradually increased. He had had treatment at various times, including injections of salvarsan, which gave him considerable relief, but in spite of this he continued to grow worse, suffering from paroxysms of coughing and choking of sufficient severity to keep him awake. His main symptoms were dyspnea, and pain in the chest and upper extremities. Later in the course

Fig. 1

of the disease insomnia was marked. He spent most of his terminal time in bed leaning forward, resting his head and elbows on his knees, and during his last days he was kept more or less constantly under the influence of large doses of morphine.

Six days before his death 660 c. c. of clear amber fluid were withdrawn from his left pleural cavity. For the last two months of his life there was a softened area at the apex of the aneurismal protrusion from which a thin sanguineous fluid constantly exuded.

Finally, one morning he was seized with a violent hemorrhage from the mouth and nose and expired in two or three minutes. Death was believed to have been due to rupture of the aneurism into a bronchus.

After death his body was secured and brought to the Laboratory of Anatomy of the University of Pennsylvania. Instead of performing an ordinary autopsy, permission was obtained to do what we wished, and we therefore had the body injected with formaldehyd solution and frozen. Then the thorax was isolated from the head and neck, arms and lower abdomen, and cut into serial sagittal sections about two inches thick.

Fig. 1 is a photograph of the patient taken shortly before his death. It shows clearly not only the aneurism itself but also the eroded area through which bloody serum was constantly seeping.

Fig. 2 is a section, viewed from the left, cut approximately through the middle of the clavicle. It shows nothing of the aneurism itself, but a number of the pressure effects of the latter. The lung is seen to be collapsed and the pleural cavity filled with coagulated and frozen serum. The stomach is almost filled with clotted blood and posterior to it can be seen a portion of the left lobe of the liver. The diaphragm is depressed, more so posteriorly over the liver than anteriorly over the stomach, the dome being practically obliterated.

Fig. 3 is a view of the same section as Fig. 2 after the pleural sac had been cleared of serum. This shows very well the atelectatic condition of the lung and brings into plain

Fig. 2

view the pericardium and the upper surface of the diaphragm. On the anterior surface of the upper lobe is a long fibrous scar, which upon section was found to extend into the lung tissue to the depth of almost one centimeter. The lung above this scar and also at the extreme upper portion of the left apex was adherent to the costal pleura. The aneurismal protrusion is shown very clearly in this figure as well as in Fig. 2.

Fig. 4 is a section cut just lateral to the left margin of the sternum and the section is viewed from the right; this is the right side of the slab of tissue whose left side is shown in Figs. 2 and 3. The aneurism and the pleural sac have been cleaned of serum and clots, and the pulmonary vessels and air tubes of their contents.

In this section the aneurism comes into view for the first time. It is apparently of an hour-glass form and has burrowed through the chest wall above and below the second costal cartilage. The condition, however, is only apparent, as probably the sac eroded forward first through the sternum and then advanced laterally, destroying first the soft tissues and later the bone and cartilage. It is interesting to note the thinness of the anterior wall of the aneurism, consisting as it does only of skin and fascia. In the recent condition the whole of the hour-glass sac was solidly filled with laminated clot. Just below the posterior part of the sac is a small diverticulum and anterior to this is a calcified lymph node.

The upper and lower parts of the interlobar pulmonary fissure are visible and separated by it can be seen the collapsed lobes of the left lung. The atelectatic condition of the lung causes it to appear to be much more closely studded with vessels and bronchi than is normally the case.

The heart comes into this section in the shape of the lower part of the left ventricle. The base of the heart has been pushed far downward by the aneurism and hence the columnae carneae run much more horizontally than is normal. One papillary muscle shows very plainly.

Fig. 5 is a view of the left surface of the next section. If the slices of tissue were placed together in proper order this surface would be in contact with that shown in Fig. 4. It

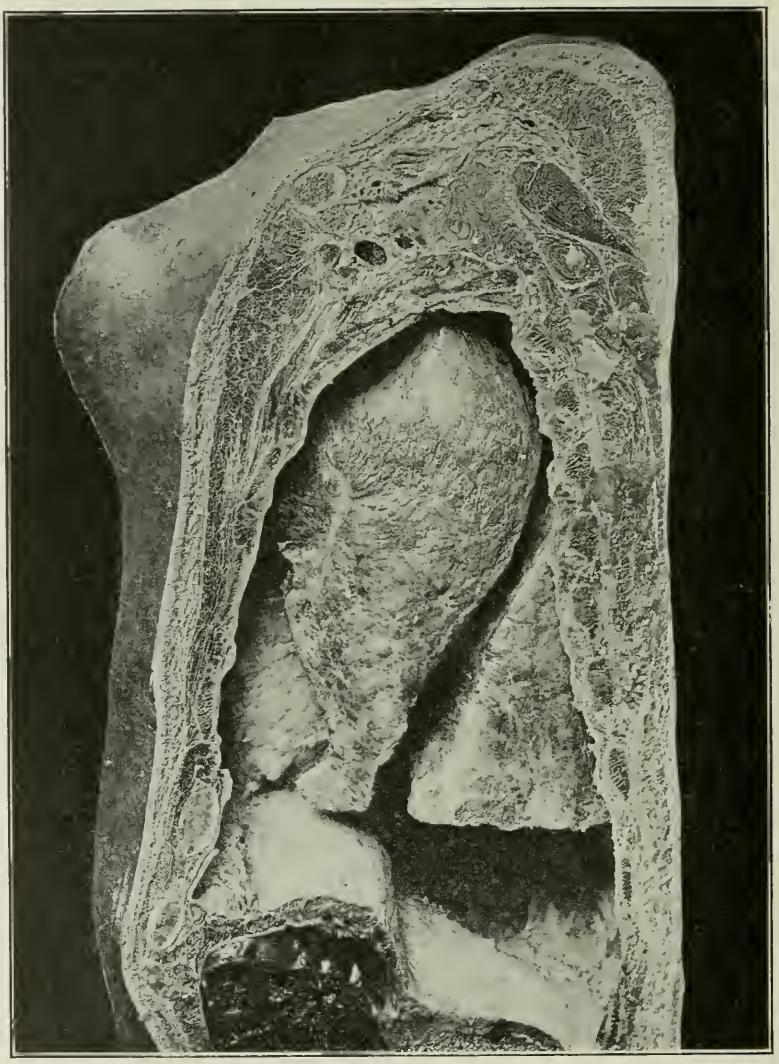


Fig. 3

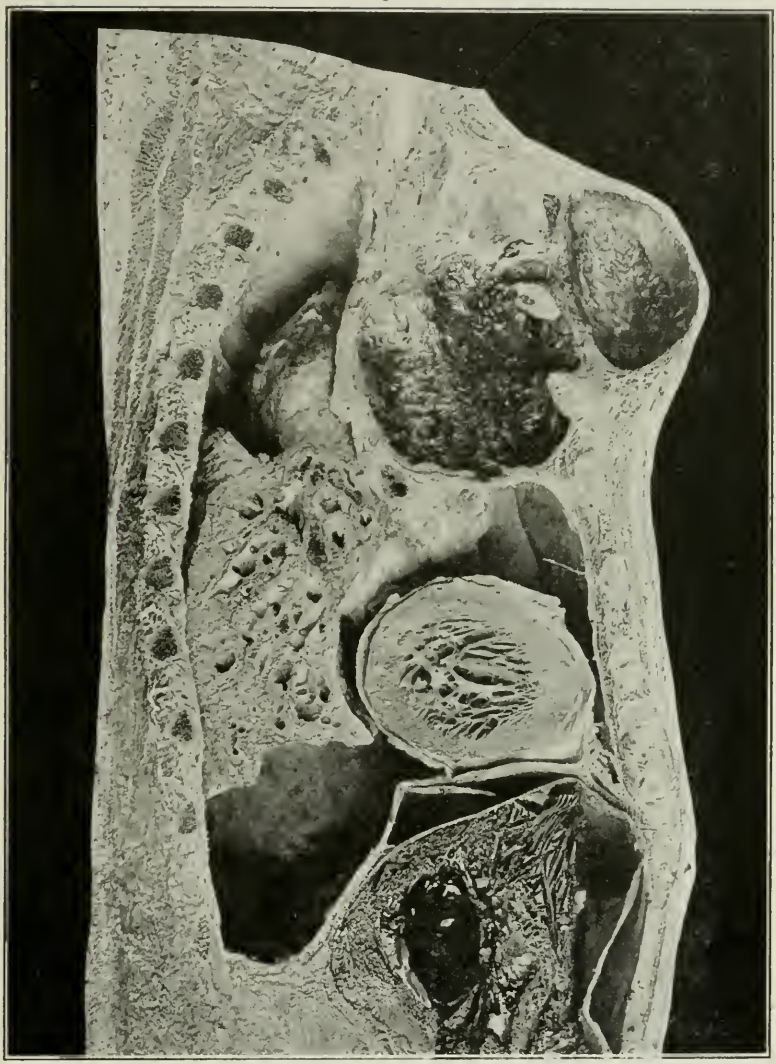


Fig. 4

Fig. 5

differs from Fig. 4 in that the various cavities were not cleaned of their contents, the clot being allowed to remain in the aneurism and the coagulated frozen serum in the pleural cavity.

The aneurism is well shown, filled in this (its left lateral) portion with a firmly organized laminated clot. After thawing out, the clot was found to have the consistency of a stiffened sponge and its interstices were filled with blood and serum. It is obvious at a glance how futile would have been an attempt to have treated this case by wiring.

When the pleural outlines are compared with those of the lung, the great degree of pulmonary atelectasis present can be well appreciated. The bronchi were filled with purulent secretion, and this condition may have helped to account for the patient's occasional rise in temperature.

The pericardial sac in this section was densely calcified.

The left ventricle is shown in this section and one of the papillary muscles is beautifully depicted. The position of the latter helps to emphasize the abnormally horizontal position of the heart.

Fig. 6 depicts a section through the middle of the sternum and spinal cord, the slab of tissue being viewed from the right.

The aneurism here appears in its largest dimensions and it is seen as it really is, one large single sac. It has eroded completely through the sternum, all of the manubrium and the upper part of the gladiolus being completely absorbed. The lower part of the latter projects upward into the aneurism as rough naked bone, apparently not covered by periosteum.

Only a small portion of the sac, the posterior portion, remained open as a blood channel during life. The remainder was filled with clot as described above, although blood and serum did ooze through the interstices of the clot and constantly drip through an opening in the skin on the anterior chest wall.

At the posterior part of the aneurism can be seen a small funicular depression with a tiny opening at the apex. This opening was the point of rupture and the flattened dark area posterior to it is the compressed left bronchus into which rup-

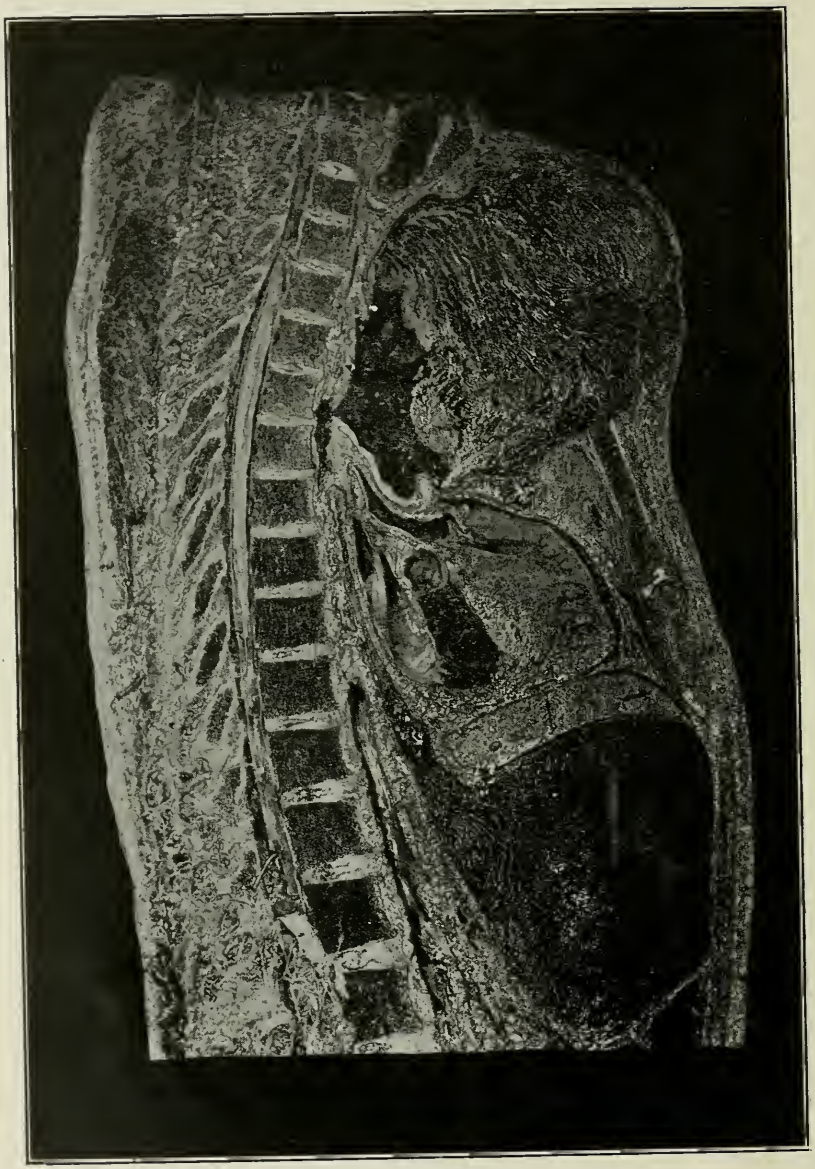


Fig. 6.

ture took place. We were very fortunate in having this opening occur right in the plane of section. Above and posterior to the aneurism is the bifurcation of the trachea, which is filled with blood.

There was no direct communication between the sac and the esophagus and the blood which filled the stomach was first coughed up and then swallowed. This process must have been going on for some time before death, since the latter was very sudden and apparently the result of suffocation.

The flattened mass of tissue between the sac and the vertebral column, and extending from the point of rupture up to the tracheal bifurcation contains the left bronchus and the esophagus. The trachea was pushed very much to the right by the aneurism and the left bronchus is seen on its way from this right-sided position back to the left lung. It is compressed between the sac anteriorly and the esophagus and vertebral column posteriorly.

Many interesting things are shown in the heart. Above and anteriorly and appearing as a tube-like structure is the conus arteriosus of the right ventricle. At its posterior end can be seen the pulmonary valve separating the conus from the pulmonary aorta. All of these structures are much compressed and forced downward and backward. There must have been a greatly diminished blood stream going to the lungs, and this in connection with the putting out of commission of the left lung would amply account for the extreme dyspnea suffered by the patient. At the posterior part of the heart is the left auricle, in its natural position, but much altered from its normal ovoid outline. It is greatly flattened from before backward, especially at its upper part, where can be seen the flattened ostia of entrance of the two left pulmonary veins. The interference here with the return circulation readily could account for the left sided hydrothorax.

Anterior to the left auricle can be seen the cavity of the left ventricle, with some of the chordae tendineae and columnae carneae. The thickness of the left ventricular wall is only apparent, as the section happened to transverse the interventricular septum.

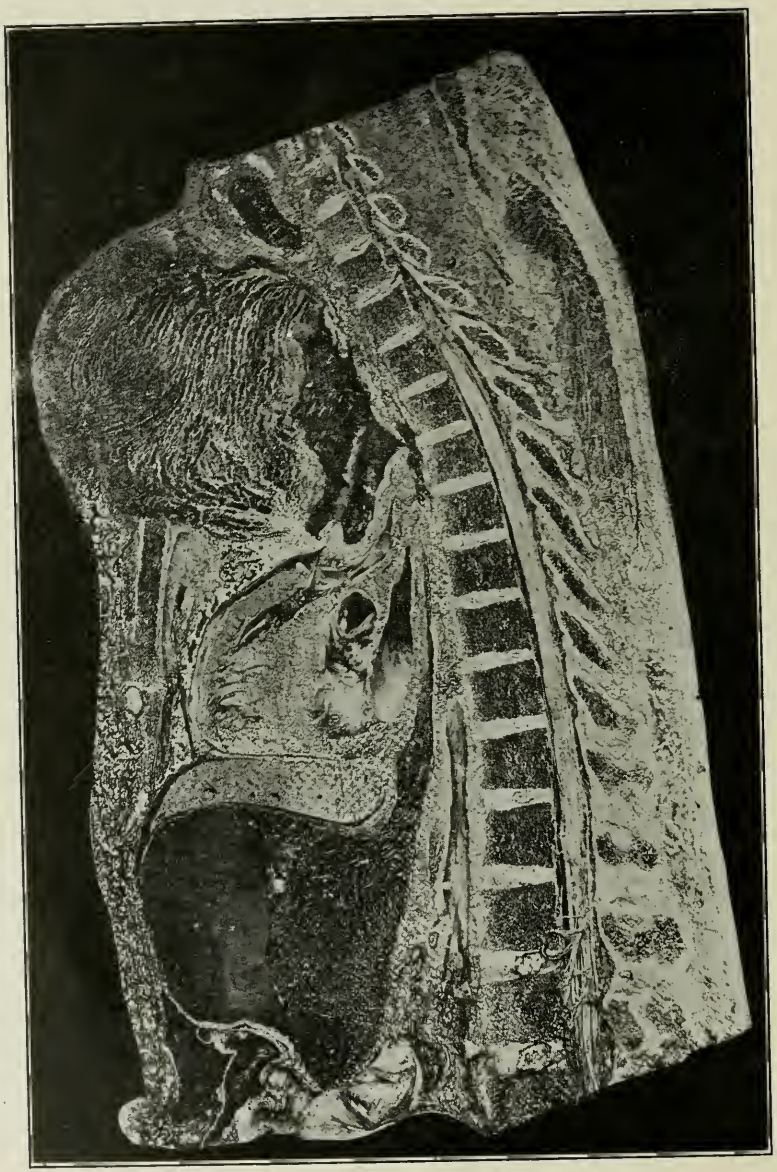


Fig. 7

Fig. 7, like Fig. 6, is a midsternal, midvertebral section, but differs from it in depicting the right side of the thorax, viewed from the left. Most of the points mentioned in describing Fig. 6 will apply to this plate.

Two leaflets of the aortic valve are shown at the upper end of the left ventricle, anterior to the left auricle.

Posterior to the left auricle, and easily located by tracing it upward from the stomach, is the lower part of the esophagus. It is seen to be filled with clotted blood. In its upper part it was found to be greatly compressed by the aneurism. In view of this it seems rather odd that dysphagia had not been a more prominent symptom. While the patient had been unable to swallow solid food for some time before his death, liquids gave no great amount of trouble and certainly the blood which reached the pharynx during the last hours of the patient reached the stomach without difficulty. The lower part of the esophagus, in addition to the stomach, was found after death to contain much blood.

In regard to the site of rupture it is interesting to note the smooth crater-like character of the aortic intima at this point. There is no tearing of a thin vascular wall, as one might expect, but what appears to be a gradual absorption and final giving way of the thick aortico-bronchial tissues at a point where pressure had been most marked and long continued. The point of rupture was exactly where the column of blood driven into the sac by each contraction of the left ventricle would first impinge upon the aortic wall. At this spot was what appeared to the naked eye as a smooth foramen of communication between the aneurism and bronchus, and the aneurismal intima and the bronchial epithelium appeared to be continuous structures, which is highly improbable.

Fig. 8 depicts a section, viewed from the right, cut just lateral to the sternum, in the same relative plane on the right side as Figs. 2 and 3 on the left. This plate shows the gradually decreasing size of the aneurism as the distance from the midline increases, and when compared with Figs. 2 and 3, shows that the preponderance of the sac is on the left side, as would be expected. The right bronchus is filled with blood,

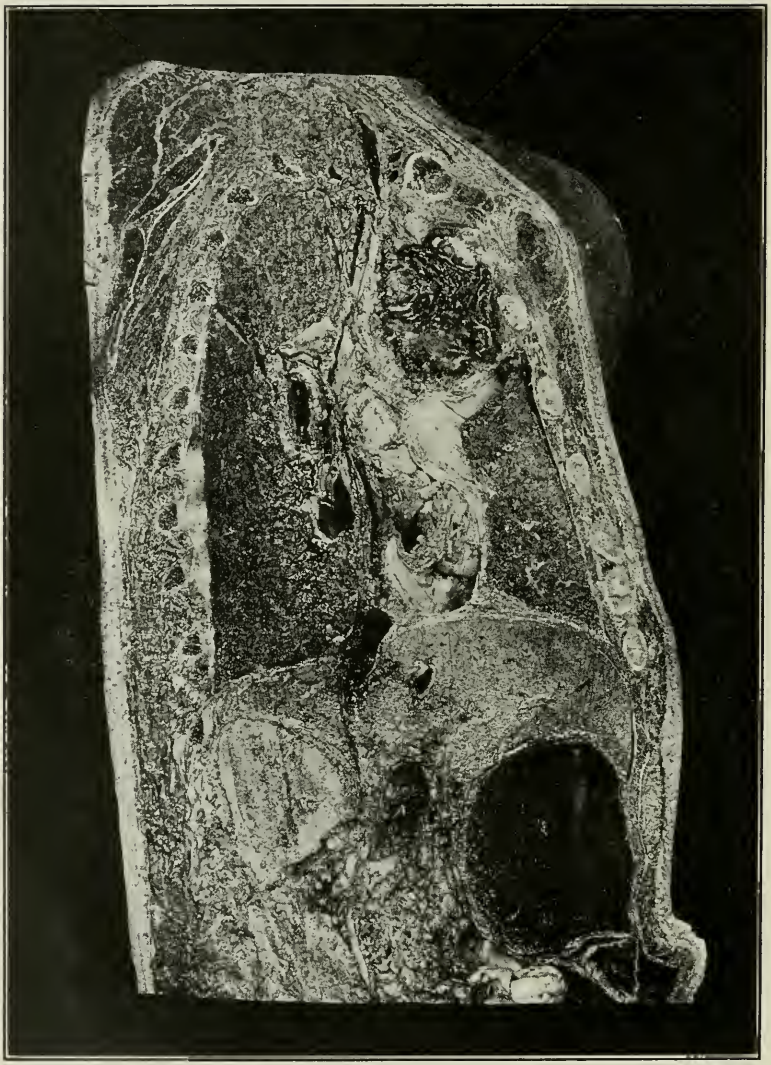


Fig. 8

this lending support to the belief that suffocation was the cause of death, but retains an approximately normal shape and position, instead of being displaced and compressed as noted on the left side.

Below the bronchus is seen the extreme right end of the left auricle, just medial to the place of entrance of the right pulmonary veins.

The main points of interest in this report we believe to be the following:

1. Photographs of the patient obtained at various periods during life showed successive steps in the growth of the protruding mass.

2. Frozen sections were made of a case which had had careful clinical study, and as a result conditions as they had existed in vivo could be accurately reproduced and deliberately studied after death. Search of the literature reveals the fact that this is the first opportunity of this kind which has arisen and been taken advantage of.

3. The exact site of rupture, and the cause and mode of death could be determined and depicted with a degree of accuracy, certainty and detail which would be impossible of attainment in an ordinary autopsy.

4. The hydrothorax, the pulmonary atelectasis and the extreme dyspnea are explained in a manner which by any other method of study would have been much less satisfactory, if at all possible.

5. The last statement is equally true of the anatomic relations. The altered position and general changes in the bronchial tree and other thoracic contents are depicted in such a graphic manner as to show to the laryngologist and internist alike what it takes place in the presence of such a lesion as this large aneurism. It also suggests what it takes place in some of our future clinical cases in the presence of other disturbers of the normal intrathoracic relations.

## Discussion

Dr. Greenfield Sluder, St. Louis, Mo.: I think the Society is to be congratulated for all of these pictures. It seems to

me that the labor in presenting Dr. Fetterolf's material is exceedingly great. We are constantly dealing with disturbances that seem trivial which, if we bear in mind the relations within the chest, are frequently separated and put into a more serious category. It has been my experience within the past three months to, as it were, pick up two aneurisms of the aorta by virtue of dislocation of the wind-pipe recognized in the laryngeal mirror, and a number of times I have outlined the same dislocations within the mediastinum, distortions of the windpipe, as a means of recognizing poritracheitis or mediastinitis. Sometimes they are not of tubercular origin; more frequently I believe them to be tubercular. In one case that proved exceedingly desperate for some six months, the infection was a primary tracheitis going on for a length of time with mediastinitis, and distortion of the wind-pipe. I feel that Dr. Fetterolf's work helps us very greatly in the recognition of these cases.

# PRESENTATION OF PATHOLOGICAL SPECIMEN OF LARGE TUMOR OF PITUITARY GLAND.

R. C. LYNCH, M.D.

I would like to present for your inspection this specimen of an unusually large tumor of the pituitary gland. It is interesting from several standpoints. The man was a quadroon about six feet, one inch tall, with hands and feet somewhat larger than usually seen, though not sufficiently so to be suggestive. He was well developed to the point suggesting fat with a fairly developed chest and mammary gland and broad hips resembling in a degree the feminine type. Had scanty pubic and axillary hair, though the head as you see (and it is usual) is well covered and thick. He was seen by my colleague, Dr. Keitz, of Charity Hospital, to whom I am indebted for the following notes.

About the end of July, 1916, he had profuse nose bleed following heavy work, with recurrences daily, when the nose began to block up, voice became hoarse and the eyes began to protrude. Upon examination the septum was deviated strongly to the left, the right nostril filled with an irregular spongy red mass which bled easily upon manipulation; pupils were dilated and did not respond to light or accommodation: pulse 80; eye grounds show slight pallor with double temporal hemiopia or loss of vision over the outer half of each eye. A specimen of tissue was removed for the laboratory which was reported back as sarcoma.

I saw the patient in December with the same symptom complex apparent only slightly aggravated. To me the exophthalmus was very marked, the superior maxillary prognathism was and is apparent. The mass in the nose was as described and could be seen in the naso-pharynx.

I first attempted to remove the mass through the nose but

only succeeded in taking out a small part in this way. The tissue sent to the laboratory, our pathologist reporting it as granulation or inflammatory, but not malignant. Upon the second trial I did a facial decortication and at the same time opened into the right antrum. This gave me plenty of room to remove the mass more completely, but when I found the

Fig. 1. Sections from Tumor of Hypothesis.

roof of the nose and over both orbits pulsating and with my finger could feel the meninges and see the dura, I was convinced that it was time to stop; fearing lest the sudden loss of support would produce a hernia.

I packed the nose to take the place of the tumor mass and put in a large postnasal plug, tying the attached string to

the ear as is usual. He was returned to bed in good shape but upon waking from the anesthesia he caught the string and pulled upon it with such force as to force the post nasal plug through the exposed dura and into the brain. He died from a basilar meningitis.

The specimen I present to you for observation together with

Fig. 2. Sections from Tumors of Hypothesis.

the X-ray plates, and a micro photograph of the tumor which is charactertistic of pituitary gland.

I will be indebted to you for any discussion.

## Discussion

Dr. Thomas Halsted, Syracuse, N. Y.: Dr. Hubbard suggests that I report the present condition of a case of hypophy-

seal tumor which was reported to this Society two years ago. Briefly the case is that of a little girl eight years of age, who at that time had as the leading symptoms great increase in size of her head, great increase in weight, weakness, constant shaking of head with incoordination of movements so that she was unable to feed herself, optic neuritis, sharp headaches, very striking change in color and texture of hair, polyuria,

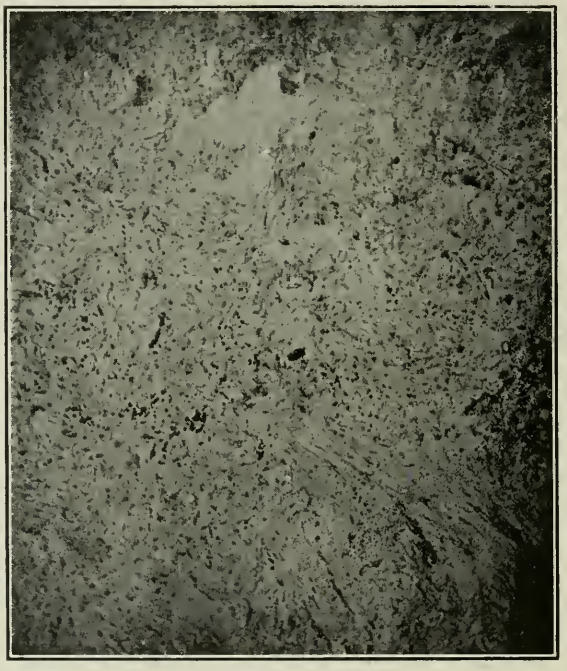


Fig. 3. Sections from Tumors of Hypothesis.

and disturbed mental acuity. The operation was done through the nose under local anesthesia; it was the modified Hirsch operation, the tumor proved to be a cyst of the hypophysis. The patient was much improved temporarily but some months later it recurred. A second operation was refused by the parents. It is now nearly three years since the original operation. I have not seen the patient in a year, but six months ago the father stated that the child has now an aggravation of all the foregoing symptoms. She has become very fat, with

great weakness, and the blindness is I think total, or at least total so far as noticing objects.

Dr. Henry L. Swain, New Haven, Conn.: I would like to ask Dr. Lynch what was the condition of the brain of this patient?

I had a case which I saw but once before this death in which there was bitemporal hemianopsia which was due to a tumor of the pineal gland causing an enormous drop of the ventricles in which there were headaches somewhat similar to the second case.

Dr. Robert C. Lynch, New Orleans, La. (Closing Discussion): In reply to the question of Dr. Henry L. Swain as to what was the condition of the brain of this patient, would say that the brain did not show anything pathological at all, except that the coverings represented the usual findings of death from meningitis.

We scraped up in New Orleans three other cases of pituitary tumor, and all of them showed on X-ray a very marked enlargement and beginning protrusion backward of the sella turcia. They all showed the same phenomena as regards the eye grounds, and they all showed the symptoms of lack of function of the pituitary gland.

# ABSCESS OF FRONTAL LOBE OF BRAIN

R. C. LYNCH, M.D.

The case which forms the basis for this manuscript has no parallel in the fifty cases collected and reported by Dr. T. Passmore Berens before the American Otological Society in 1913, and the seven additional cases including his own, collected and reported by him to this society at its last meeting. It is for this reason and because of the problems presented during the period of treatment that I present this subject to you.

In order that you might be familiar with the foundation of the patient, I will quote you the first paragraph of her life history as prepared for me by her husband. Mrs. L. was always active mentally, a hard student, and an energetic teacher. Though not robust, she was very active physically, and seemed never to tire. For considerably more than fifteen years, however, she has been not only an invalid, but a sufferer; her condition varying only as to the degree of her suffering, which was often very great. The pain from time to time confined her to bed for varying periods and frequently the intensity was so great as to cause convulsions accompanied by a severe rigor and a bending backward, so that whiffs of chloroform were used to bring about relaxation. There were varying terms of slow recovery to a condition that enabled her to leave her bed, but she never was well, and had headaches which were almost continuous.

In 1907, following right sided abdominal pain, an ovary was removed with no improvement. In 1909 a panhystereetomy was performed; following this a period of relief ensued, but in 1912 the headaches grew so intense that a rhinologist was consulted. A right maxillary sinusitis was irrigated for nearly a year, but with only varying relief. A change was made and the second colleague removed the right middle turbinate, opened the right frontal intra-nasally, and curetted the ethmoid cells. There followed a long period of treatment

without relief. Dr. Van Wart, neurologist, under whose care the patient had been, made total and differential counts which always displayed a leukocytosis about 11,000 with a poly count near 80.

Late in 1913, while in Virginia, an acute exacerbation in the right frontal sinus occurred, demanding an external operation. The Kuhnt principle was followed and while removing the membrane from the sinus quite an accumulation of pus was found beneath the membrane and the bone, though the posterior wall was intact and normal. The usual long packing followed and apparently an obliteration followed this procedure completely for there never existed any communication between the sinus and the nose. There seemed to be no improvement, however, for the headaches were always present with periods of great intensity. Blood counts were always indicative of pus absorption in spite of the sinus findings.

The following year, a second trip was made to the surgeon for consultation who dismissed the patient as a confirmed neurasthenic, the scar showing no evidence of any disturbance and the nose apparently clear; but, the right eye showed a loss of vision for the lower half of the field and the fundus was pale.

The patient had periods of chills, rise in temperature, and severe headaches with a gradual subsidence, the blood counts at this time showing rises to 14,000 with 82 to 85 polys. In 1916, she was referred to me by Dr. Van Wart with the assurance that something was at fault in the economy of the patient and that the symptoms were not neurasthenic and he hinted at possibly the ethmoid or sphenoid sinuses.

After careful examination, I found the right antrum to have a large opening through the inferior meatus and irrigation of this cavity showed slight pus at times, but which bore no relation to the headaches. The middle turbinate was cleanly removed, the meatus showing no pus, no communication could be established with the frontal sinus and the external wound was a credit to the operator—with no evidence of any disturbance there, though this was the region of the headaches. She would describe them as deep in her head behind the

right eye over the occiput and down the right shoulder and between the scapulae.

The post ethmoid region seemed full and bulging and I was

able to wash nearly a teaspoonful of non-offensive pus from the sphenoid sinus. Treatments of this character seemed to be followed by considerable relief from headaches and relieved

the chronic hawking and spitting complained of, though she had during the period of this treatment one of the chill-temperature-headache attacks which seemed to have a certain

regularity as to recurrence regardless of the treatment employed. She was so improved, however, that a trip to Bermuda was taken for rest and possible benefit. While away

she enjoyed good health, but on her return contracted a severe cold on the sleeper, which immediately renewed all of the old symptoms.

The sphenoid was full of pus and I felt sure that the post ethmoidal cells were also involved, while the anterior group and frontal sinus region looked fine. Accordingly, under general anaesthetic, I opened the post ethmoidal cells with a Sluder knife and the sphenoid with a Skillern punch and forceps. The bone seemed very hard and the membrane lining and sphenoid very thick and polypoid. While removing the membrane from this cavity, my ring curette caught on something which proved to be a sequestrum of the lateral wall, and upon its removal the cavernous sinus and dura were plain to view. The wound was packed lightly and the patient progressed nicely for five days, when as I see it now another exacerbation occurred with chill, rise in temperature, increase in blood count to 17,000 and 92 polys, stiff neck, intense unilateral headache, positive Koenig and Babinsky, dimness of vision in the right eye and an apparent basilar meningitis.

I was anxious for a spinal puncture, but fearing lest the decrease in intra-cerebral pressure have some influence upon the exposed surface in the sphenoid or possibly be followed by a tear in the cavernous sinus, decided against it. The syndrome continued for about 72 hours and began to subside with a falling blood count to 9,000 with 80 polys, return of vision, relief from headaches and general improvement to such an extent as to permit the patient to return home, resume her living and enjoy her automobile. This joy was not long for about four weeks later another exacerbation occurred with syndrome as described above and in spite of a perfectly healed ethmoid sphenoid wound with no drainage and a free nose except for occasional scabs, there ensued now a gradual decline in body strength and a slight dullness of mentality with no desire for food and persistent headaches of increasing intensity, blood counts rising to 17,000 with 90 polys, blood pressure 110, rather low, no focal symptoms of any kind as determined by a most searching examination by Dr. Van Wart.

The decline reached the state of involuntary micturition

and defecation, mental dullness to almost coma and inability to suck fluids through a straw, to be roused only on the greatest excitement and speech then inaudible—still no focal symptoms. On her return to the hospital, I determined that the symptoms were those of brain abscess in the silent area, the frontal lobe; accordingly, I opened up the old frontal sinus wound which was apparently perfectly healthy and sound, but to my surprise there existed a small cavity holding about 15 drops of milky pus looking much like an old mucocele. On removing the membrane from the posterior wall the bone looked normal and was intact completely. I could not feel satisfied, however, that the findings were sufficient explanation for the symptoms and took down the posterior sinus wall. The meninges seemed normal and not adherent in any direction and there was no bulging or undue pressure apparent. I split the dura and the brain surface seemed normal, so I explored with aspirating syringe and large needle, applying suction as soon as the needle was below the surface. After about an inch deep following the line of the base of the skull and away from the longitudinal sinus and under the anterior horn of the ventricle, there gushed into the syringe about 3 drams of yellow-green pus. I withdrew the needle and prepared the bone opening and area for the reception of one of Mosher's wire gauze drains, reintroduced the needle and withdrew 4 drams of pus. Then I opened with a scapel what I thought was abscess cavity, but try as I might with needle, knife, or forceps, I could find no evidence of the abscess. Finally, I passed a small rubber tissue drain into the brain in the direction and to the depth at which I had aspirated pus and dressed the wound. Upon recovery from the anaesthetic the patient was conscious and in six hours addressed me voluntarily, complaining of some soreness about the wound, but not of much headache.

Dressings daily revealed no pus and finally on the sixth day the drain was removed and the brain explored again for pus, but again without result. The wound was kept open for two weeks more fearing lest a reaccumulation would reproduce the symptoms, but on the contrary, her progress now

was rapid—headaches gone, mentality very clear and bright, representing her old self; and the blood count dropped steadily to 5,800 with 64 polys—the lowest it had ever been in her life history so far as we have it.

The pus showed staphylococcus aureus in pure culture, but not active, growing feebly on culture. The wound has healed and the patient returned to her normal life, better than she has been for 15 years or more. The abscess was opened on the 17th of December, 1916, and she is now on a pleasure trip east.

I would call your attention to the very indefinite etiology. One would naturally think and believe that it was secondary to the frontal sinus, yet it had no stem so far as I could determine and the meninges showed no change in the neighborhood of the sinus. It would be a most unusual location to follow the sphenoid experience, and yet the sequestrum of the sphenoid would make one suspicious. The septic cycle syndrome periodic would seem now to indicate the gradual progress in the development of the brain abscess which culminated in the symptoms just before the operation. The right lobe, the silent area giving no focal symptoms as to a clue for location, the normal pulse never below 78 and the low blood pressure rather speaking against the intra-cerebral lesion, yet the persistent, deep seated unilateral headaches were surely plain evidence of something intra-cerebral with typical blood picture and negative nasal findings. Finally, the wisdom of the advice against spinal puncture which in the light of our present experience would have resulted in a rupture of the abscess and the death of the patient. Finally the abscess wall was so thin as not to be felt by the needle, knife or forceps even though the history points to long chronicity and its immediate collapse upon aspiration without reforming puzzles one to know just how, when, and why it all happened.

# EXTERNAL SURGERY OF THE SUPERIOR MAXILLA IN TREATMENT OF NASAL DISEASE

JOHN F. BARNHILL, M.D.

In the preparation of this paper I have reviewed most of the transactions of the several American special societies covering the period of my membership. These records represent, no doubt, the opinion of the foremost rhinologists of the time concerning the operative procedures best suited to the cure of malignant and other tumors of the nose. With but slight exception the surgical problems of the upper jaw as practiced by the rhinologist and recorded in the articles I have consulted, have been attacked through the nose or nasopharynx, and if external surgery was thought necessary rhinologists usually have sought the services of a general surgeon.

The chief pathologic affections of the nostril, which because of its intimate association must include the maxillary antrum, and which may require extensive surgical procedures to cure, are sarcoma, epithelioma, fibroma and osteoma. Every rhinologist of wide experience must have seen many cases of sarcoma and carcinoma of the nasal interior, while no doubt he has occasionally met with osteoma and fibroma in this region.

While not many papers have appeared in the transactions on these subjects, evidently the question has been of interest to the society as indicated by the discussion called out by each. The papers pertaining to the treatment of malignant conditions of this region that seem most to indicate the progress and belief of the American Laryngological Society are those of J. Price Brown of Toronto. Many here present will doubtless recall these papers and the discussion which followed. Dr. Brown reported collectively nine cases of malignancy of the nose with cure in all but one. His treatment was

by daily electro-cauterization of the growth for a number of sittings, afterward watching for any recurrence, and repeating the cauterization immediately should evidence of return appear.

In the progress to cure by this method, Brown reports the fact that the patients were often seized with chill, followed by high temperature of a septic nature and that more than one case nearly succumbed to sepsis. Nearly all who discussed these several papers agreed with Dr. Brown that treatment of nasal sarcoma and epithelioma by cauterization, curettage or snare gave the best end results and the greater number of cures. Among those who concurred in this view, wholly or in greater part, were rhinologists of such wide experience as E. L. Shurley, C. G. Coakley, John O. Roe, D. Bryson Delavan, J. E. Logan, Thos. Hubbard and E. F. Ingalls. The latter employed the cold wire snare, galvano cautery and chromic acid in a case of naso-pharyngeal myxo-sarcoma, under observation 27 years, with ultimate recovery. Dr. C. Melville Black removed a pediculated sarcoma from the nose and cauterized the base with trichloracetic acid, the patient remaining well for 13 years. So strong was the belief of E. L. Shurley in the value of intra-nasal cauterization of sarcoma and so much was he opposed to external surgery of the jaw as a means of cure that in 1909 after commending his favorite plan and narrating cases of cure he closed with the statement that when occasionally the rhinologist passed a case to the surgeon the latter almost invariably passed the patient to the undertaker.

Drs. H. L. Swain, Wm. L. Ballenger, J. Payson Clark and C. H. Knight have advocated some form of external surgery as best suited to certain cases they had seen personally. Dr. Ballenger employed Ollier's operation of turning down the nose by an external incision and thus exposing the nasal interior broadly for the purpose of removing the growth. Knight engaged the services of a general surgeon, who did a partial excision of the upper jaw, with the result that the patient remained well after 3½ years. He recognizes the deep situation of malignant nasal growth in many instances, and states that it seems to him "unwise to indiscriminately recommend

intra-nasal operations unless we are able to show beyond question that the lesion is pediculated or circumscribed."

Opposed to intra-nasal methods of dealing surgically with nasal malignancy, as advocated by rhinologists, is the view of the general surgeon who proposes and practices some plan of external surgery for its eradication. In reviewing several modern text books on surgery no mention is found of any intra-nasal method for the removal of a malignant growth of any part of the superior maxilla. The view of the general surgeon seems to be that any plan of intra-nasal removal of a malignant growth in this situation, which probably extends to the maxillary antrum or to osseous structures beyond the nose, would be trifling with a disease the complete eradication of which is entirely essential to cure. This difference in the viewpoint and method of attacking nasal tumors of the nostril, and its environment depends to some extent, no doubt, upon the degree of surgical training of each class of operator, and also upon the respective ability of each to accurately locate the origin of the growth. In case the origin is from the ethmoid, turbinates, septum or one of the walls of the nostril the symptoms of early obstruction will cause the patient to consult the rhinologist, who either from tradition or belief in its greater efficacy, will almost without exception attack from within. If, however, the growth begins without the nostril the general surgeon sees it, usually at a late stage, and attacks it by those external methods universally approved by his branch of the profession.

Again, and rather frequently, malignant disease of the upper jaw attacks the alveolar process first, and from the fact that the earliest symptoms are neuralgia referred to the teeth, loosening of the teeth and swelling of the adjacent alveolus, the patient is first seen by the dentist, who has been known to treat the teeth and even to extract healthy teeth, evidently in the belief that the disease is in some way connected with dental surgery.

Statistics are not clear as to whether malignancy of the upper jaw occurs oftener from without or from within the nostril. It is certain, however, that it may begin in either

locality and spread to the other. The important point is to know the seat of the beginning of the invasion in any case, for if two classes of surgeon, the rhinologist and the general surgeon, are to continue as in the past, each to follow an operative plan entirely different from the other, statistics for the treatment of malignancy of the upper jaw probably will not be greatly improved. A study of reported cases of sarcoma especially demonstrate on the one hand that rhinologists often have cauterized and snared at malignant growths in the nose whose undoubted seat must have been in some distant part of the maxilla, while on the other hand the general surgeon has been guilty of removing the entire upper jaw for a disease that had its origin in the nose or in the party line between the nose and antrum. T. H. Farrell has reported such a case where the surgeon removed the maxilla only to find that the attachment of the tumor was in the region of the ethmoid and did not involve the antrum or its external walls.

Dr. Price Brown's cases evidently were affections limited solely to the nose, and of least malignant type, since otherwise the comparatively superficial methods of his treatment would not have ended so happily as reported by him. Crowding of the nasal structures against the septum because of pressure growth arising within the antrum is very common. The symptoms arising from this source simulate growth wholly of nasal origin, and in all such cases might easily be mistaken by the novice. It would clearly be unfortunate should this mistake be made, and especially if on that account treatment should be instituted wholly through the nose.

While it is probably true that the statistics of the rhinologist are better than the statistics of the general surgeon in the treatment of malignancy of the nose and its environment, these statistics are not entirely fair to external surgical methods. It is conceded by all that the length of time a malignant tumor has progressed prior to the operation has much to do with the end results of most operated cases. It is undoubtedly true that the rhinologist and the dentist see malignancy of the maxillae at an average earlier time than does the general surgeon. Sarcoma or carcinoma develop symptoms of dis-

tress much earlier when origination is in the nose or alveolus than when the origin is in the antrum. Antrum malignancy may progress many weeks or even months before there is external or nasal swelling and before pressure symptoms cause pain. In the nose very moderate swellings block breathing and set up hemorrhage, thus furnishing emergency reasons for consulting the rhinologist; whereas, if the alveolus is the center of development, the teeth feel long and loose, are often painful, and the swelling of the gums leads to the belief of abscess formation. Hence the early dental consultation, the earlier opportunity providing a correspondingly better chance of cure. The illustrations of superior maxillary sarcoma, such as usually are given in the text books, represent the progress of malignancy at the time the general surgeon usually sees the case. The cheek is tumified, the eye often closed, bulging or crossed; the nose is blocked and frequently the tumor reverses the arch of the hard palate into the mouth. At operation by external methods the orbit, naso-pharynx, nose, ethmoid, spenoid and sometimes the frontal sinus are found involved. The present bad statistics of external operation should be expected from surgery at this late period, for in the past the dentist, general practitioner and rhinologist have, only at a period approaching hopelessness, called the surgeon to their aid.

A candid view of the facts concerning this surgery of the upper jaw for malignancy is not altogether encouraging. Two sets of surgeons, each working toward a border line, have neither accomplished results collectively or singly such as we most desire. It would seem wise that, if there is to be a border line that must limit rhinologic surgery, such a line should be placed distant from the nostril and should include at least all of the superior maxilla. The reasons for this I believe are clear and some of them have been stated. External surgery of the maxilla is essential, usually more essential to cure than intra-nasal surgery. The rhinologist who pretends to do radical intra-nasal surgery should prepare himself to follow surgical disorders leading from the nose to any part of the upper jaw if not, indeed, to wherever they may lead.

When this is done, and when the diagnosis is made earlier than at present, great improvement of statistics may be expected.

It is not necessary to describe the external operation. That is done in all text books on surgery. These texts undoubtedly lay too much stress on total excision of the maxilla for the reason, apparently, that it is presumed the disease has always advanced to a point that involves the whole upper jaw, or that any procedure short of total excision is inadequate. If the diagnosis is made as early as is usually possible, should the rhinologist be given opportunity, it is not necessary, indeed it would be most reprehensible practice, to remove the whole jaw. Instead partial resection may be entirely sufficient. In case the tumor occupies the floor of the antrum, the alveolus, the external nasal wall or all combined, even the orbital plate may be preserved greatly to the comfort and preserved facial appearance of the patient. Should the lower turbinate and the adjoining external nasal wall only be involved, both the orbital plate and the hard palate may be preserved and yet a complete and thorough eradication of the disease be accomplished. One of the chief objections to the external surgery of the maxilla has been the deforming scars, the misplaced eye and the palatal defects that result. Early and definite diagnosis as to the seat of the beginning of the growth, and an early studied plan of operation will very largely avoid this objection. Heretofore the plan of operation has been too much a matter of doing one of two things in any given case, namely, some degree of intra-nasal surgery by the rhinologist, or complete removal of the jaw by the general surgeon. Earlier opportunity and sufficient thought bestowed on any given case on how best to break away from the traditional plan of total resection will in all probability find a satisfactory modified, yet thorough operation to fit each condition present. Excellent plans for operation of partial resection of the jaw have been brought out by Moure, and are suitable and sufficient in most cases where the exact nature of the ailment is recognized and the operation performed at an early date. Moure's operation

takes the place of and is in every way better than the Rouge or the Ollier operation. It gives a better exposure than either of these operations and has the advantage that, should the disease be found more extensive than thought previously to beginning the operation, the lines of incision of the soft parts can easily be extended, the parts reflected and the whole jaw, if need be, resected.

Following any of the partial resection operations, and especially Moure's, the nostril and antrum are seen through the nostril as one cavity· the naso antral wall with its turbinate having been removed. It is easy therefore to fully inspect the former seat of disease, to note the earliest tendency to recurrence and to attack the same in a comparatively open field.

External surgery of the superior maxilla is sometimes, though perhaps rarely, necessary for the removal of osteoma and especially of nasal or naso-pharyngeal fibroma which have invaded the antrum or other parts of the upper jaw. I have operated twice by external methods for the removal of invading fibroma.

### *Case Reports*

Since the paper deals briefly with the external surgery of the superior maxilla, mere mention will be made of the fact that I have seen but four cases of undoubted malignancy whose origin was evidently within the nostril. Three of these cases were sarcoma, one epithelioma. All were operated intranasally, with one recovery—a spindle cell sarcoma of the inferior turbinated body. Two cases later extended to the ethmoid and antrum, were operated externally, one dying within about one year following the external operation and the other within eighteen months. One case returned in the naso pharynx and was so rapidly extending that the patient lived but a few weeks after the onset of the nasal ailment.

### *Cases of External Surgery of the Maxilla*

Case I.—Farmer, age 49. Has had catarrhal discharge and some blocking for several months. Nose became stuffy in Sep-

tember, 1905. December 15th, at the time of my examination, the right nostril was completely blocked by the turbinates which were reddened, swollen and jammed against the septum. Blood-streaked mucous covered the turbinates. Several moderate and one sharp hemorrhage from the nostril were reported. There was slight redness and tumefaction of the cheek adjacent to the nose. There was no bulging of the palate and no alveolar disturbance. It seems evident that the tumor arose in the antrum and by pressure jammed the outer nasal wall and its turbinates against the septum. December 20th a partial resection of the jaw was made. The growth apparently sprang from the naso antral wall high up and filled the antrum but did not involve the floor either of the nose or antrum. The ethmoid and middle turbinate were completely infiltrated and the orbital plate toward the inner canthus was decayed. All were removed, but the hard palate was spared. The patient was greatly relieved for about six months, when severe headache came on. Examination at that time showed a recurrence in the ethmoid region, probably extending into the frontal sinus. Operation June 6, 1906—opening the frontal sinus over the brow and extending the incision into the old wound over the ethmoid. The frontal sinus was filled with a fungating mass which was removed together with the muco-periosteum down to the bone in every direction by means of a large curette. The inner table of the skull on the posterior wall of the sinus was absent over a considerable area, the dura was exposed and infiltrated, fungating. The wound was packed with gauze the lower end of which hung into the nostril. The external wound was sutured. The relief from pain and nasal stenosis was satisfactory, the patient returning to his home in Illinois. I did not see him again, but he died in October, 1906, with symptoms of meningitis, evidently from further brain extension.

Case II.—Boy, age 13. Seen in October, 1906. Had made no special complaint until about one week previously. Had been in school only four days previously to his visit to my office. Had had pain in the teeth and face with slight swell-

ing over the face leading to consultation with family physician and dentist. The first molar tooth was extracted and the antrum perforated by the dentist in the belief that there was an antral abscess. Profuse bleeding but no pus followed penetration of the antrum by the dentist. Examination of the nose showed completely jammed turbinates and completely blocked nostril. There was no pus in the nostril. The age, rapid development of the growth and other symptoms strongly suggested sarcoma. Removal of the jaw was proposed but the father wished to think about it for a time. Five days later the child was brought for operation, so weak and prostrate that it was necessary to carry him. Complete resection of the jaw was made, the growth extending to antrum, ethmoid, spenoid and alveolar process. Great relief followed, the child was able to return home and cure seemed probable. Return of the growth, which was round celled sarcoma, was evident in three months, and death followed shortly after a second removal.

Case III.—Late case of epithelioma, springing from the region of the middle turbinate and ethmoid. Several nasal hemorrhages, some severe, were reported. The right eye was turned slightly outward and the lower lid and cheek edematous. Intense headaches had persisted for many months. Consulted me November, 1905, chiefly because of the headache and nasal stenosis. The nose was filled with a reddened mass, which was in turn covered with bloody mucus. A section of the middle turbinate was removed with a snare and the report on the same by the pathologist of Indiana University School of Medicine was epithelioma. It seemed evident that cure from any means was not probable, but the patient wished operation if relief from the headache could be promised. Operation November 15, 1905, showed an extension from the ethmoid into the frontal sinus and maxillary antrum. The posterior wall of the frontal sinus was necrosed and the adjacent dura was fungating. The whole jaw was removed excepting the outer half of the orbital plate and the palatal process. The patient lived for about six months afterward,

the first four months following the operation in comparative comfort.

Case IV.—Girl, age 12—office examination May, 1906. Had received an injury to the right cheek six months previously. Swelling of the cheek was present but almost no pain was complained of. The right nostril was completely blocked. The cuspid and first molar teeth felt long to the patient and were sore on occlusion. The child looked anaemic but otherwise appeared in good health. The parents had no thought of the presence of serious disease. An explanation of the dangerous character of the ailment was given and a section of the inferior turbinate was removed by the snare, for examination. It was giant celled sarcoma. June 7th the entire upper jaw was resected with the exception of the orbital plate. The tumor sprang from the front wall of the antrum, low down, involved the aveolar process and naso-antral wall. Recovery took place, the child remaining entirely well, apparently, until the fall of 1912 when recurrence appeared suddenly. Death occurred in less than three months afterward.

Case V.—Girl, age 13. Examined at office September, 1916. One month previously had struck left cheek against the corner of a desk. Tumefaction of cheek followed but did not subside. Neuralgia pains were complained of in the teeth of the affected side. The family physician, believing that an abscess of the antrum was present, consulted a rhinologist. Two of the loose teeth were extracted by him and the maxillary antrum was perforated through the alveolus. Severe bleeding, but no pus was found. Suspecting malignancy the case was referred to me for possible operation. At the time of my examination the alveolus of the left side was swollen and slightly tender. Several teeth were loose. A probe could be passed into the antrum through the socket of the tooth extracted the day previously. Bleeding followed the probing. Has had no nasal hemorrhage. Lower turbinate swollen, red and moderately jammed against the nasal septum. Diagnosis, sarcoma. Operation September 9. The entire left superior maxilla, excepting the orbital plate was removed, using the

cautery very extensively for all excisions except those through the skin. Healing was prompt and satisfactory, being complete in one month. In February, 1917, child returned with a large lymphatic lump under the opposite jaw. No other lymphatic enlargement. The child had suffered a slight sore throat previously, and this, together with the fact that the glandular affection was on the opposite side to the sarcomatous jaw led to the diagnosis of simple infection. The gland was the size of a small egg, was excised and one section contained pus in its center. Examination of specimens removed were made by Professor Virgil H. Moon of the Indiana University School of Medicine. The tumor of the jaw was spindle cell sarcoma; the gland was simple glandular infection. The patient is entirely well at present and has grown and gained rapidly in weight. A dental plate with an obturator has been beautifully fitted by Dr. C. A. Barnhill, and this overcomes sinking of the cheek, prevents food entering the wound-cavity from the mouth, and enables the patient to masticate perfectly. Close inspection of the child is necessary to detect any deformity. The fact that a complete diagnosis was made and a thorough excision of the jaw was performed within one month of the onset gives hope of permanent recovery in this case.

Case VI.—Woman, age 57. Consulted me in January, 1917. One year ago struck the face against the edge of a door in the dark, with considerable force. Some swelling of the cheek followed. Had consulted several physicians and surgeons, the most trusted of whom advised non-interference of any kind. Swelling in the cheek increased in three months and the nostril became blocked. Had first molar tooth extracted and antrum bored through alveolus. No severe suffering but usual good health impaired, and is worried. Inspection of nose shows blocking with swollen turbinates. Bleeds easily on probing. Removed a small mass through the alveolar opening in antrum, for examination. Laboratory report, epithelioma. Removed the whole upper jaw February 28th excepting the orbital plate. Many places in the antral wall necrotic. Entire antrum filled with fungating mass. Ethmoid structures

removed to os planum. Rapid recovery, and recent examination shows no tendency to return. It is probable, however, because of the late period of operation, that return of the growth in the head, or mestastasis, may be expected.

### Discussion

Dr. Joseph H. Bryan, Washington, D. C.: I am very much interested in this paper of Dr. Barnhill's, for I am in favor of external surgery in these cases. I had a case operated upon this Spring, not a malignant growth, but an exaggerated fibromatous condition. The face was enormously distorted, the eye greatly displaced, and it was clearly impossible to remove it intranasally. I did the Moure operation and was greatly pleased with the tremendous facility which it afforded for the complete removal of everything within the maxillary antrum and also the facility with which it aids in removing not only the growth in the antrum, but the complete removal of the whole nasal wall including the superior, middle and inferior turbinate bodies. In this case unfortunately the under surface of the wound became infected and broke down. It, however, healed thoroughly, and while the scar is somewhat prominent along the infra-orbital ridge it was more than a good result under the circumstances. I believe this operation of Moure is by far the best operation, that is, for complete eradication of all these growths which take place within this cavity. This was not a malignant growth, but the same thing would apply to any growth which takes place within that sinus.

Dr. D. Bryson Delavan, New York City: I have listened with the greatest interest to this very scholarly paper. Unfortunately the ground covered is sufficient to fill a system of surgery, embracing as it does all the varieties of new growths and several difficult questions in surgical procedure. It is impossible, therefore, to discuss all of the points it suggests. The claim that naso-pharyngeal fibroma is best treated by radical surgical measures leads me to say, that I stand to-day exactly where I did when I published the articles on that subject to which the reader of the paper refers. Of course, there may be exceptional cases where the growth has advanced far beyond what is usual, perhaps involving the sinuses. In such it may not be practical to apply the treatment of at least thirty years ago which in the case of the less well developed growths has never been improved upon. This treatment can

easily be learned in the literature of the subject. At present it seems to be a lost art and the advocacy of drastic surgical methods a return to the harsh methods of two generations, or more, ago.

The proof of the value of the electrolytic method is that while case after case has been lost under the radical surgical treatment, I have never heard of a case dying from the plan of treatment advocated by Voltalini and Lincoln to which I referred. I have not been able to find any in literature where death has resulted. The results are far better in every respect. We have not time to enter upon the details of the matter but I want to call attention very earnestly to the value of the electrolytic method.

With regard to the gaining of access to the cavities of the maxillary bone, the nasal cavity and maxillary sinus itself, some growths can only be approached through some external opening. In attempting to treat such cases with radium, it cannot be brought into communication with the growth. For these the best plan seems to be the opening of the maxillary sinus and the best avenue of approach to it to be through the roof of the mouth, where complete access can be gained and where the opening can be kept patent. This is a great advantage in that it enables the repeated application of the radium and in all directions.

This whole field is a very wide one. As time goes on we change our views in respect to many things. I am anxious to change mine whenever I have found something better in place of the old. But in the case of naso-pharyngeal fibroma I have never seen anything nearly as good as this treatment which I mention. No one who understands and has had experience with it, provided its application has been made with sufficient good judgment and skill can fail to recognize its absolute superiority.

Dr. Hanau W. Loeb, St Louis, Mo.: There are two things to which I should like to refer in connection with this major surgery.

One is with reference to the value of electrolysis in these growths. I reported a case a number of years ago in which the tumor was removed by the electric cautery and in which the hemorrhagic tendency was tremendously reduced by using the electrolysis method.

The other matter is the case of going into the naso-pharynx by removing the posterior portion of the palate as I did in a case of carcinoma in the epipharynx, a case not yet reported, in which a classical incision was made putting on one side and

removing the bony portion. The ease with which we were able to remove the mass from the naso-pharynx was wonderful.

Dr. D. C. Greene, Jr., Boston: The subject as presented involves a field or rhinology occupied previously by general surgeons, and I would like to say a few words with this point in view. As Dr. Barnhill has said, the tendency has been for general surgeons in cases of malignant disease of the upper jaw, to perform a stereotyped operation, usually the classical operation, for removal of the upper jaw. In many cases, such an operation removes a great deal of healthy tissue unnecessarily, and what is worse, fails to reach the limits of the disease. It seems to me, that we, as rhinologists, are especially qualified by reason of our technic in intra-nasal examination, to carry out a more careful observation and removal of the diseased tissue, than the general surgeon.

I have been fortunate enough to operate successfully on three cases, and there has been no recurrence in either case, of fairly extensive sarcoma of the nose, involving the antrum and ethmoid sinuses, in which a complete exposure of the growth was obtained by means of the Moure incision, so that a complete removal of the tumor could be effected in each case. The results have been most satisfactory. One case operated on eight years ago has had no recurrence, another done four years ago and another one year ago. My point is that I believe it should be emphasized that we are better qualified to examine and treat these tumors surgically, than the general surgeon, because of our general training and technic in intra-nasal work.

Dr. John F. Barnhill, Indianapolis, Ind.: (Closing Discussion): The chief reason in bringing this subject forward was, I believe, to attack the view of rhinologists which needs some revision concerning this subject. A review of this has shown that the rhinologist has too often attacked a great subject from a trivial standpoint. If he can definitely demonstrate that the disease is in the floor of the nose or septum, it then seems wise, judging from statistics, that he is entirely justified in attacking this by means of electro-cauterization. But if, as may happen, the disease has begun in the naso-antral wall, or has begun in the alveolus and spread to the nose, or in the antrum and spread to the nose, or has begun in the ethmoid and spread to the nose, the rhinologist should recognize that fact and then either send this patient at an early date to a surgeon or, if he is qualified to deal surgically with it, he should do that. It seems to me that the time has

come when we should not be guilty of attacking a great subject in a small way.

The question of diagnosis is undoubtedly the greatest one here as in other lines of medicine and surgery. It is only a few years since it was said that nearly all cases of sinus thrombosis died either with or without operation. They don't die now. And why? Because we find them early and operate them early and get them well. You will remember you were told to wait for sinus thrombosis until there was a temperature and the patient was running a course of sepsis that was well marked; in other words, we had to have many visible symptoms before diagnosis. Now, we operate while the patient is yet operable and we get him well. If with that same acumen the rhinologist sees that here is a turbinate which bleeds easily, that here is a turbinate jammed against the septum, here are a number of loosened teeth—these are symptoms very clear and readable, symptoms of the approach of some malignancy, and if he operates this patient early through the modified external operation, he cures his patient and leaves him almost without a scar. I emphasized, or tried to do so in my paper, the fact that the general surgeon has not gotten the case in time to do anything else but the classical resection of the whole upper jaw. Rhinologists have attacked these sarcomas, have treated by trivial intra-nasal methods until there was nothing else to do but to pass them over to the other fellow, and the other fellow immediately passed it over to the undertaker, as quoted in the paper. There was nothing else to do but to pass them on to the undertaker when so far advanced. But, it is possible in nearly every instance, if we use some skill, judgment, care and patience to make a diagnosis in these cases early enough to cure at least some of them.

# STEREOSCOPIC ROENTGENOGRAMS OF THE HEAD

J. M. INGERSOLL, A.M., M.D.

During the past five years we have had stereoscopic Roentgenograms of the head made in all cases in which we have done any major operations upon the head. The longer we have used the stereo-Roentgenograms the more certainly have we been convinced of their practical value, for they give us definite information in regard to the nose and the nasal accessory sinuses, the brain and many of its blood vessels, the ear and the mastoid, which can not be obtained in any other way. The size and boundaries of the maxillary and frontal sinuses can be distinctly seen. If there are any septa, tumors or foreign bodies in these cavities they can be accurately located and defined. The ethmoidal and sphenoidal sinuses over-lie each other and are thus somewhat masked, but their position, relative to each other and the orbit and the other surrounding structures, can be clearly distinguished.

The location of malignant tumors and the amount of involvement of the structures by such tumors in the ethmoidal and sphenoidal sinuses is a little less definite than it is in the frontal and maxillary sinuses, but in all cases it is much more definite and accurate in the stereoscopic plates than it is in a flat plate. Purulent infections in the sinuses usually cast a heavier shadow than the normal structures and so are easily recognized, but occasionally a sinus with pus in it seems to transmit the Roentgen rays nearly as well as an uninfected sinus.

Dimpling, or little depressions in the inner table of the skull, indicates increased intra-cranial pressure and is almost positive evidence of brain tumor or abscess or hydrocephalus, except in micro-cephalic skulls. In such cases the dimpling is usually very evident and is due to the increased intra-cranial pressure within the abnormally small skull. The depth and extent of the depressions usually give some idea

of the length of time that the increased intra-cranial pressure has been present.

The density or specific gravity of the majority of brain tumors and brain abscesses is about the same as the brain tissue and so they do not cast any shadow in the Roentgenogram. If the tumors are dense or calcified they can be accurately located. If a brain abscess is encapsulated its shadow will usually show in the plate and in some cases the abscess may be very definitely outlined.

Skill in interpreting the Roentgenograms can be more easily acquired by the surgeon than by the Roentgenologist, for the surgeon has the decided advantage of being able to verify and correct the findings in the Roentgenogram while he is operating. If the surgeon will carefully study the stereoscopic picture before operating, compare his interpretation of the picture with the condition which he finds in the operation and then study the picture again after the operation, he will soon acquire great skill in interpreting the stereoscopic plates.

The study of stereoscopic plates of a macerated skull shows distinctly all the principal anatomical points and enables one otherwise unfamiliar with stereoscopic plates, to recognize easily the landmarks in the picture of the living subject. In studying stereoscopic plates they should be examined from both sides. First, put the plates in the stereoscope with the film sides toward the mirrors. This will show the structures as we see them in the operation, with the external parts in the foreground and the deeper structures in the background. Then by reversing the plates in the stereoscope, turning the smooth sides of the plates toward the mirrors, the structures will be seen from the inside of the skull.

I have with me for demonstration in the stereoscope the following plates. Macerated skull, anterior-posterior view, showing all the accessory cavities of the nose.

Plates showing both mastoids of this skull at the same time. Copper wires have been placed in the semicircular canals of the right labyrinth so as to identify them positively. The advantage of taking both mastoids on one plate is self evident. If only one mastoid is infected, the uninfected mastoid serves

as a normal standard so that both, the normal and the infected mastoid, can be studied and compared at the same time.

Plates showing an osteoma which developed in the left frontal sinus, and extended into the right frontal sinus, both orbits, both nasal fossae and the brain cavity in spite of an operation during the early development of the growth, in which I thought I had removed all the tumor.

Plates showing a bullet lodged in the right mastoid antrum after it had passed through the left orbit and posterior ethmoidal cells, the right sphenoidal cavity and temporal lobe of the brain. The course of the bullet can be traced distinctly through these structures in the stereoscopic picture. I removed the bullet in a radical mastoid operation.

Plates showing a calcified tumor of the cerebellum, about 3.5 cm. long and 2 cm. thick. This case was under Dr. George W. Crile's care at Lakeside Hospital and I saw it in consultation. The patient was in exceedingly bad condition when he was admitted to the hospital. Dr. Crile did a decompression operation, but the patient died later.

Plates showing a temporo-sphenoidal abscess with gauze for drainage in the abscess cavity. The abscess was secondary to a chronic suppurative mastoiditis and was located in the stereoscopic plates before the operation. I opened and drained the abscess through the mastoid wound. The plates which show the gauze in the abscess cavity were made one week after the operation. The patient recovered completely.

Plates showing necrosis over the sigmoid sinus secondary to an acute otitis media and mastoiditis. This case was promptly operated upon and recovered, although he had a beginning meningitis when he was admitted to the hospital.

Plates showing a tumor of the hypophysis extending into and nearly filling both sphenoidal cavities. This patient was nearly blind when he was admitted to the hospital and refused any operative work, except a decompression. This relieved his eye symptoms and headache.

The following description of the technique for making stereo-Roentgenograms of the head was given to me by Doc-

tors Hill and Thomas, Roentgenologists in the Medical Department of Western Reserve University:

*Technique for Making Stereoscopic Antero-Posterior Radiographs through the Frontal Sinuses.*—The special apparatus needed for this purpose consists of a stereoscopic tube stand, a plate changer and an inclined plane, the angle of elevation of which is about 23½ degrees.

The plate changer is adjusted by means of the inclined plane so that it lies on the table at approximately 23½ degrees elevation from the plane of the table. The tube is centered vertically, in reference to the table, over the middle point of this plate changer and then adjustments are made so that when the tube is moved 1¼ inches to the right or left and the tube holder tilted, the central ray will strike the same point on the plate changer.

The patient is then placed on the table, face downward with the forehead at the upper portion of the plate changer and the glabella over the central point. Care must be taken that the head lies squarely on the plate changer, so that the mid-saggittal plane through the head is at right angles to the plane of the plate changer.

The movement of the tube from one side of the head to the other is at right angles to this same mid-saggittal plane. The exposure made with the tube moved 1¼ inches to the right and the tube holder properly tilted, as above mentioned, will produce the right eye image, and the exposure made 1¼ inches to the left of the median line will produce the left eye image. The exposures are made during suspended respiration.

A compression cone diaphragm the size of the No. 1 Kelly-Koett diaphragm is used and a heavy leather filter is placed over the patient's head.

*Technique for Making Stereo-Roentgenograms of Both Mastoids on a Single Pair of Plates.*—The patient lies on the table, on the left side, with the side of the head resting on a small table which is lead lined except over an area five inches wide across the center of the table. The ear is turned forward to prevent the shadow of the cartilages of the ear obscuring the Roentgenogram of the mastoid. The head is placed so that the

mastoid lies over a centering spot on the middle section of the table where there is no lead lining.

The tube is placed so that the line of the principal ray passes through the head at an angle of twenty degrees above a line through the auditory meati.

The stereoscopic adjustments have been made before the head is placed on the head table, so the line of the principal ray shall always focus on the centering spot over which the mastoid is placed. Then on the left half of one 8x10 plate marked "R" for instance, the right eye Roentgenogram of the left mastoid is made. This plate is then removed from the slide in the head table without the patient's position being changed, the tube is shifted for the left eye image, and on the left half of a plate marked "L" is made the left eye Roentgenogram of the left mastoid. The patient is then turned on the right side with the right mastoid placed over the centering point as was the left, and on the right half of the plate marked "L" the left eye Roentgenogram of the right mastoid is made. This plate is then removed, the patient remains quiet, plate "R" is inserted in the slide of the head table so the exposure will come on the right half of the plate. The tube is shifted for the right eye, and a Roentgenogram of the right mastoid for the right eye is made. This gives right eye Roentgenograms of each mastoid on the plate marked "R," and the left eye Roentgenograms of each mastoid on the plate marked "L."

These plates, when developed, are placed in the stereoscope with the one having the right eye images in the right light box of the stereoscope, and the one having the left eye images in the left light box. With the glass side of the plates turned toward the mirrors of the stereoscope we view the mastoids from the inside of the skull, while with the film side of the plates placed toward the mirrors we view the mastoids from the outside of the skull.

## Discussion

Dr. Robert C. Myles, New York City, N. Y.: I am very glad that Dr. Ingersoll has written this paper. I advocated

this at the New York Academy of Medicine presenting sterograms and Roentgenograms, but I don't know why they did not take it up in New York. As he has demonstrated it is much better than most of us believe it to be and the topographical anatomy is shown better by this method than by any I know of.

Dr. Hanau W. Loeb, St. Louis, Mo.: I want to substantiate what Dr. Ingersoll has said, and to claim a great deal of information that has come to me from studying the stereoscopic method. It is really amazing how much more one gets to know about his work by studying one after another of the stereoscopic plates in every case which shows a disposition toward suppuration in any of the sinuses. It makes a man much better even if he does not find in any particular case any essential value in the exposure. Taking the whole thing together, he develops an understanding of the subject far beyond what can be obtained by any other method.

The beauty of this work is that you can look at a case from before backward, or behind forwards, by simply turning the plate around.

One word also about Dr. Coffin's demonstration; they are all taken in the right way. I certainly commend that type of Roentgenogram for study.

Dr. Lewis A. Coffin, New York City: I just want to say in regard to the steroscopic pictures that there is no question but more knowledge may be gained from it; but we must remember that a doctor often sends a patient in from twenty, forty, or fifty miles and unless he, the doctor, can come where a proper apparatus for setting up those pictures is, or he owns one, he cannot see the results. There are times therefore when he must put up with the flat picture which is often very helpful. We cannot always have the stereoscopic Roentgenograms.

Dr. John M. Ingersoll, Cleveland, Ohio. (Closing Discussion): I am glad to have Dr. Myles emphasize the value of the stereoscopic plates. We get new ideas in regard to the anatomical relations of the bones of the head from the stereoscopic pictures because we get the three dimensions. In regard to the interpretation of the stereoscopic plates, I think that unless a man studies them long enough to become familiar with them and develops some skill in interpreting them, he is liable to fail to appreciate their value. If he does study

them and check up the findings, I am sure he will become convinced of their value.

Dr. Loeb mentioned the value of reversing the plates. One of the great advantages of the stereoscopic plates is that you can look at them from both sides, that is, as you see the operative field and also from the inside.

In regard to stereoscopic or plain plates of the accessory sinuses showing darkened areas, I regard them simply as one of the confirmatory evidences. There are other things which enter into the cause of the shadow. A sinus which has a thickened mucous membrane casts a darker shadow than one with a normal mucous membrane. The variations of the bone structures themselves, or of the other bones beyond showing in the field, makes one sinus appear darker than another. The bones, of course, do vary, so that a dark sinus alone, as seen in the plate, should only make one suspicious of that cavity. It is not positive evidence of infection in the cavity.

# LANTERN SLIDE PICTURES SHOWING THE NORMAL AND DISEASED SINUSES OF CHILDREN FROM 1 TO 15 YEARS OF AGE *

LEWIS A. COFFIN, M.D.

These pictures were taken while considering and studying atrophic rhinitis. Many years ago before the day when the accessory sinuses received much attention, Dr. Francke Bosworth stated that atrophic rhinitis and ozena were due to the purulent rhinitis of childhood. Today we do not believe in purulent rhinitis per se but we do believe in pus-filled noses and we know that that pus has its origin in the nasal accessory sinuses.

Some few months ago, I found that several cases of ozena in which I had made free opening from the nose into the antrum through the inferior meatus so that the antrum might be ventilated and treated, cleared up entirely as to odor. I began looking for cases of ozaena and have been more than gratified by the above treatment, nearly every case, many of whom I hope to show next week at the clinical session of the A. M. A. cleared as to odor very promptly. One or two did not clear as to odor entirely and this is explained to my mind by the fact that a simple opening from the nose to the antrum is not a sufficiently radical procedure in these cases.

From the above mentioned study I became interested in the sinuses of children from a new angle, and began a study of X-ray findings. The pictures show in series, from 1 to 15 years of age, both clear and diseased sinuses. Perhaps the most interesting thing connected with getting the pictures is this: For some time I was put to it to find the diseased sinuses when I thought of the little "snotty" nosed children

* Note: No pictures of heads over 10 years of age are published and only those under that age serving to make a fairly complete series. In the X-ray pictures from children's heads more is learned as to condition of the antra than of other sinuses.

of the eye ward of the Manhattan Eye, Ear, Nose and Throat Hospital. I asked Dr. Law to X-ray these heads. Every case showed diseased accessory sinuses, a strong presumptive evidence of the intimate relationship of eye and accessory sinus disease. I take pleasure in showing these pictures.

### Discussion

Dr. James E. Logan, Kansas City, Mo.: In regard to the illustrations of Dr. Coffin, they have served to bring out an exceedingly interesting thing, namely: I have always contended that these cases of atrophic rhinitis have pre-existing conditions of accessory sinus disease. There is no question in my mind but that sinusitis results in atrophy, that is, the cases are usually pre-existing sinusitis cases. I read a paper on that subject many years ago, not so much along this line, but giving my own investigations of cases followed up all through life. Although I did not make an actual demonstration of this as Dr. Coffin has shown, I showed that atrophy followed in all of these cases.

Dr. Robert C. Myles, New York City: I would like to comment upon some of the things which Dr. Coffin has stated. One is that atrophic rhinitis in my opinion always has been essentially a child's disease. This is a purely original observation. I have never been able to find anyone who had seen a case which occurred after puberty, that is, anyone in authority. It is essentially a disease of child life. How much of it is retarded development and how much atrophic is another question. The most serious question is how should we operate on the sinuses of these children; what is the best procedure? That can be developed in the future I think. In regard to patients who are older, it has been my experience that at any age I get my most brilliant results, with regard to odor and continuance of discharge, by opening the antrum.

Dr. John M. Ingersoll, Cleveland, Ohio: I simply wish to ask Dr. Coffin whether these cases of infection of the maxillary sinuses were operated upon endonasally or through the canine fossa and what results were obtained by the operations?

Dr. Greenfield Sluder, St. Louis, Mo.: Mr. President, is this to evolute or involute into a discussion as to the origin of atrophic rhinitis, or would the Chair rule that it is to be

confined to the subject in hand. It seems to me that unless the assembly wishes it, we should not consider the question of atrophic rhinitis. If this is to be a discussion on the origin of atrophic rhinitis, may I ask how it is that the olfactory fissure in the anterior half atrophies also in the process? There is no sinus opening into that district.

Dr. Henry L. Swain, New Haven, Conn.: Dr. Coffin has come to us with the most astounding assertions. He has come with the proposition that he thinks he has additional or new evidence of the possible origin of atrophic rhinitis in the purulent rhinitis of children. He supports this by showing us pictures of numerous cases of purulent rhinitis which he chanced to discover in children's ward for eye cases. The antra were diseased and in his remarks he presupposes that these diseased antra beginning in childhood and continuing through years of early life produce, mayhap, atrophic rhinitis. Then, he states he can cure or stop the odor of all cases of atrophic rhinitis by opening up, and treating the antra. I think these are rather bold statements, and would like to hear them commented upon. Personally I believe he has mighty good grounds for his assertions.

Dr. Joseph L. Goodale, Boston, Mass.: Dr. Coffin will have an opportunity for further elaboration of that point. It would be in order for any member to request further information from Dr. Coffin.

Dr. Hanau W. Loeb, St. Louis, Mo.: I want to say a word or two. This so-called purulent rhinitis which was described so well twenty-five years ago or so is exceedingly common, and from the fact that the nasal mucosa is affected, it is easy to understand that any of the sinuses more directly connected with the nose in childhood than in adult life should be similarly affected. If the mucosa of the antra is thickened in an existing case of suppurative rhinitis, it is very natural that it should show on the screen. That explains to my mind the reason that in so many of these cases Dr. Coffin was able to find evidence of this. However, this is an exceedingly common condition and as atrophic rhinitis is fairly uncommon, he will have to explain to me why it is that so many get well without the production of atrophic rhinitis.

Dr. Burt R. Shurly, Detroit, Mich.: I should like to ask Dr. Coffin how extensive is the operative procedure following this particular line of invasion.

Fig. 1. Shadows cast by head of child six months old. Antra clear, considering the size and position at this age.

Fig. 2. Shadows cast by head of child 1½ years of age. Both antra diseased. Left more markedly. Child developed thrombosis of centra vein of left eye. From eye ward.

Fig. 3. From child 2 years of age. Right antrum clear, left cloudy.

Fig. 4. From head of child 2 years of age. Both antra cloudy.

Fig. 5. From child 2 years of age. Both antra diseased. From eye ward.

Fig. 6. From child 3½ years of age. Both antra clear.

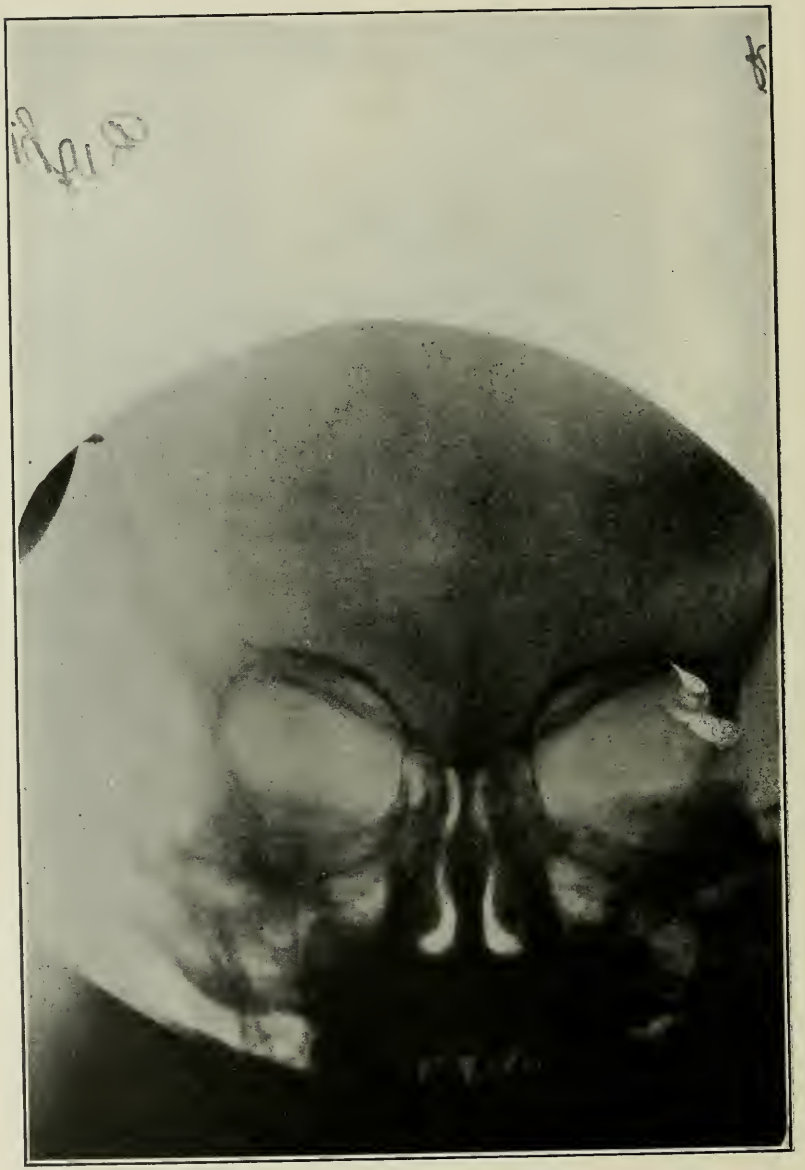


Fig. 7. From child 4 years of age. Both antra clear.

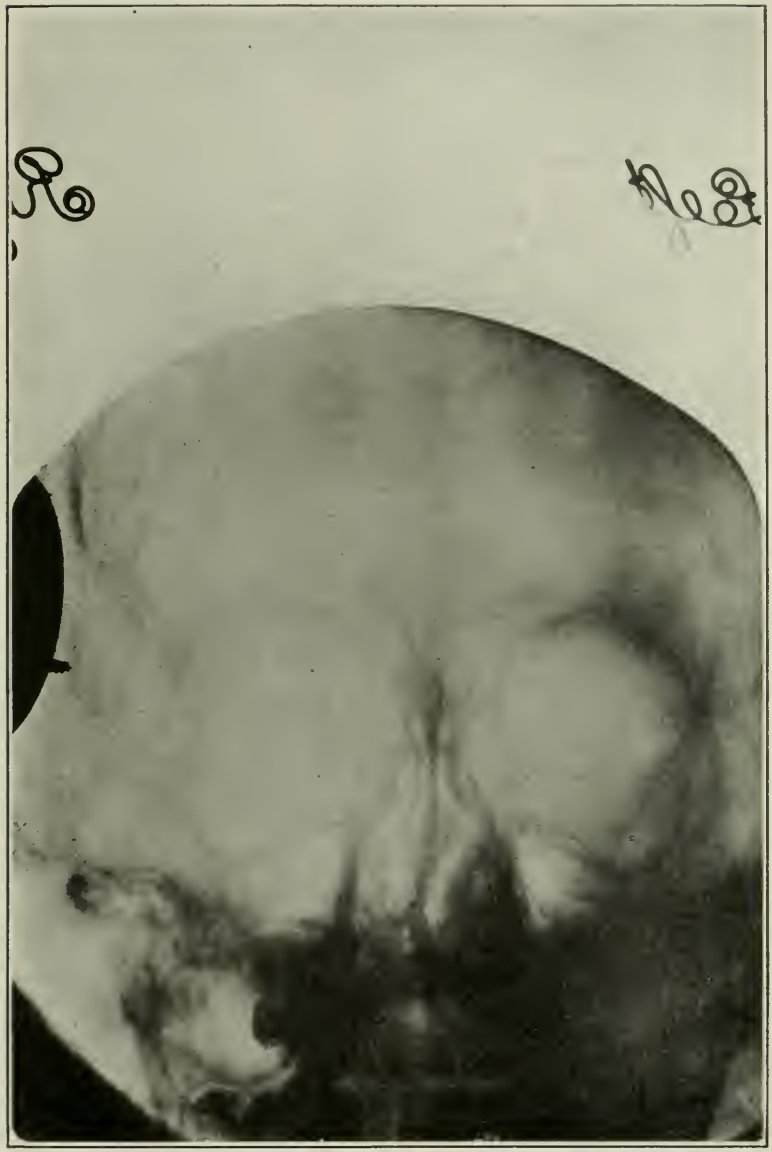


Fig. 8. From child 5½ years of age. Both antra clear. Note developing frontals.

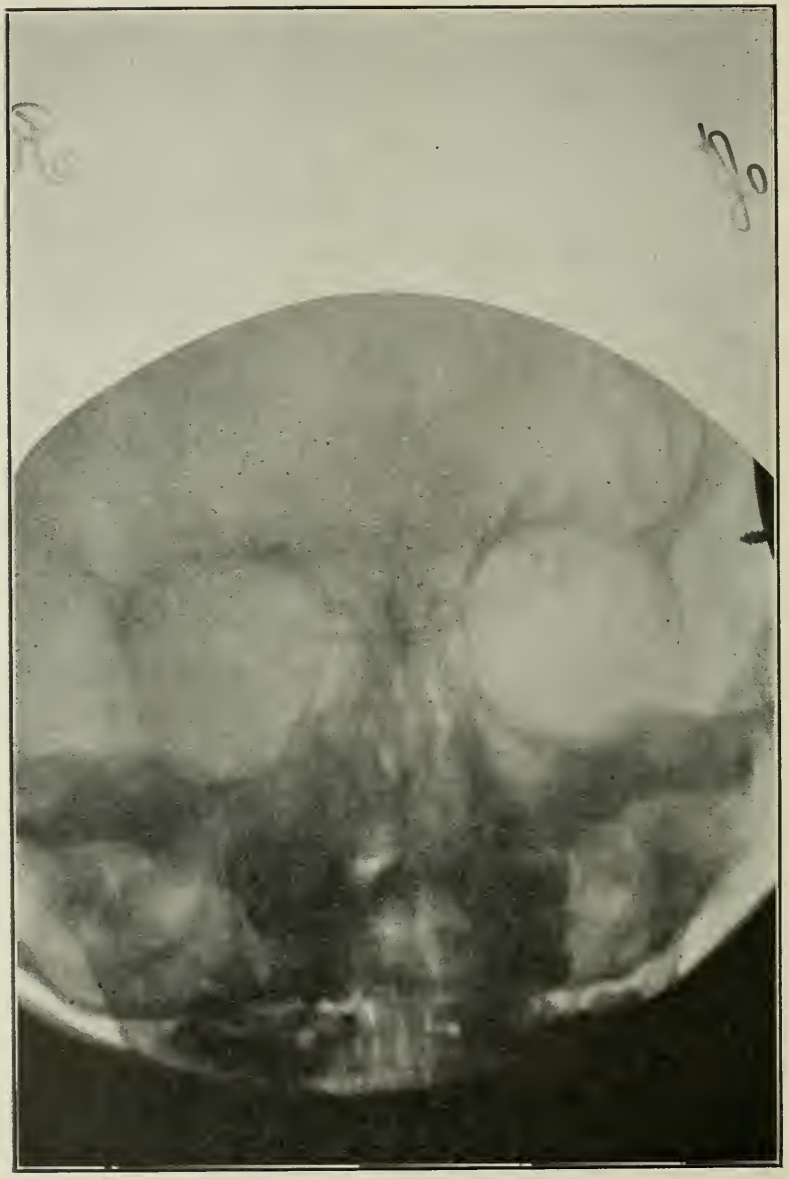


Fig. 9. From child 5 years of age. Right antrum fairly clear. Left antrum diseased. From eye ward.

Fig. 10. From child 5 years of age. Both antra clear.

Fig. 11. From child 6 years of age. Both antra clear. Note developing frontals.

Fig. 12. From child 6 years of age. Left antrum diseased. Right antrum clear. From eye ward.

Fig. 13. From child 6 years of age. Both antra diseased. From eye ward.

Fig. 14. From child 8 years of age. Both antra slightly cloudy. Note supra orbital ethmoid—left.

Fig. 15. From child 9 years of age. Left antrum diseased. Right antrum clear. Note frontal shadows. From eye ward.

Fig. 16. From child 10 years of age. Right antrum diseased. Left fairly clear. Note frontals. Right cloudy. From eye ward.

Dr. Norval H. Pierce, Chicago, Ill.: I am sure that some of these pictures are misleading. Last Winter I had two cases, children ranging from four to six years, where the Roentgenogological picture according to the readings of the Roetgenologist and myself showed anterior disease, in one case bilateral, and in the other lateral. I washed out three of these antra (in one case I washed it twice), and nothing whatever was washed out. They were quite dry antra. It could not be that they were punctured through the inferior meatus. There is no doubt but what they were dry. In the past I have had a similar experience to that, where the discharge from the nose led me to have the X-ray taken, and where the Roentgenologist said that the antra were undoubtedly diseased, but which cleared up in a very short time without puncture of the antra without any surgical procedure whatever by treating the mucosa, so that we must check up these cases of supposed disease of the antra by other means than the X-ray.

Dr. Robert C. Lynch, New Orleans, La.: Down South we see a number of atrophic rhinitis cases, and I have two children of the same family, twins, two and a half years old, perfectly well developed cases of atrophic rhinitis. I wonder whether they have lived long enough to go through the process of inflammatory changes from sinus disease to give them this atrophy. I do not think they are due to simple sinus disease.

Dr. Lewis A. Coffin, New York City (Closing Discussion): A suggestion of Dr. Swain prompted me to bring out this point. A discussion of atrophic rhinitis generally brings out an everlasting talk as does that of adenoids and tonsils. I was surprised to hear Dr. Loeb state that this is not a very common disease. In a clinic such as mine it occurs very commonly, but of course if one were to examine all the people who pass any point on a street in a given time, he would find a very small percentage suffering from ozena.

Dr. Ingersoll's question is very interesting. I found a little patient in the same ward four or five years ago, who was suffering from a keratitis. She had been in the hospital for one year. In doing a radical operation on her antrum I removed a milk tooth and the gum of the permanent tooth above it. Within three days the child's eyes were open and they have been open ever since. I hunted the child up recently to find out the jaw had developed and on casual inspection one would not know she had lost a tooth. Somebody at the Eastern Section at Philadelphia reported that he frequently opened up the antra of children under the inferior turbinate. I do

not see why it could not be done, and I shall try it on some of these cases in the near future.

Somebody asked the question as to whether these all went on to atrophic rhinitis. I presume not. Some get well, but all the cases shown here are chronic cases.

In regard to the cases which Dr. Pierce mentioned, it was brought out in the discussion this morning that tumors vary in virulency. In like manner there are changes in the lining membranes of sinuses that the microscope and pathologists cannot tell us. There are latent sinusitis cases in which the X-ray does not show much. I have operated upon cases and found no free pus and no pockets of pus in which the pathologist tells me the tissues are covered with pus. I think it is possible to get some of our worst complications from latent sinusistis cases. The antrum frequently shows dark under the X-ray; yet you cannot get water through due to a polypoid degeneration. If some water does come through, it may be free from pus.

In regard to getting rid of the ozena odor by opening up the antrum, I have been able to do it in many cases and am now simply asking you to go home and try it. Next week we are going to have the A. M. A. meeting in New York, and I shall show some of the cases at the clinical session.

We have had one case lately in which the odor was so bad as to make work on her most repulsive. I made a free opening into each antrum, washed the antra out several times and now she has a clean and odor-free nose. In some of the cases we purposely left the ethmoids to pustulate and scab in order to see if the odor persisted. If the antrum is clean, the odor has not persisted except so far in one case, and in this case I intend to do the Caldwell-Luc operation to know if the odor persists thereafter. I shall take pleasure in reporting this case more fully at a later date.

# LYMPH ANGIOMA OF THE LARYNX

CHARLES W. RICHARDSON, M.D.,

True angioma of the larynx is of rare occurrence. Dr. Emil Mayer of this Association read at the 30th annual meeting, held in Washington, May 9, 1916, a paper entitled, "Angioma of the Larynx." In this paper he brought up the then published report of growths of this character to the number of 41. In the critical resume of the reported cases, I find none that present physical or gross appearance or pathological findings corresponding to the growth which forms the subject for the paper which I now present to you.

I was requested to see M. J. G., male, 32 years of age, at his residence by his family physician, July 21, 1916. I was told that the patient had considerable difficulty in breathing and deglutition. The patient was a man of dark complexion, five feet, seven inches in height and weighed 131 lbs. He stated that during the year 1906, his voice became muffled and as a result of a laryngological examination a tumor had been noted in his larynx. His voice was muffled at my examination, not hoarse. His breathing was fairly easy. What particularly impressed me was his frequently throwing his head upward and at the same time making an empty swallow. I questioned him as to the reason for this movement, and he stated that it enabled him to breathe easier. He complained more of his inability to ingest food. He said that he had latterly lost flesh very rapidly on account of his inability to swallow. On closer inquiry I learned that this was due to the fact that his breathing became so embarrassed during deglutition that he feared to take nourishment. There was no stridor in breathing. His breathing was very much embarrassed at night, choking spells coming so frequently that he had had practically no continuous sleep for weeks. The history further brought forth the fact that he had been under treatment by several laryngologists and had been seen in con-

sultations by physicians and surgeons. The impression seemed to have been created that the growth was malignant; that an operation might be attended with a fatal issue; and that in all probability it would be wiser to let the disease follow its natural course.

Examination of nose and fauces revealed nothing abnormal. Examination of larynx—The view of the larynx was made without difficulty and without apparent discomfort to the patient. The picture revealed in the mirror was quite astonishing. A large bluish, grey mottled mass filled in the whole supra-cordal portion of the larynx. It was a smooth rounded even growth without ulceration. It was soft and pultaceous to the feel as transmitted through the probe. None of the deeper portions of the larynx were visible. The growth evidently had it origin from the right false cord the whole left ventricular wall, extending as high as the right ary-epiglottidian fold and posteriorly to the arytenoid. It extended over to the opposite wall resting on the left false cord and extending nearly on a level with the left ary-epiglottidian fold. I could see no place through which the patient gained access of air. I requested that the patient be brought to my office for a more thorough examination the next day. I now understood the peculiar head movement and empty swallowing. This movement evidently raised the growth so that the air passed more freely through the space thus opened.

By the morning when the patient reported, I had come to several conclusions.

1st. The growth was probably not malignant. In seven years if carcinomatous, it would have shown ulceration. If a melano-sarcoma, which it most resembled, it would have been fatal.

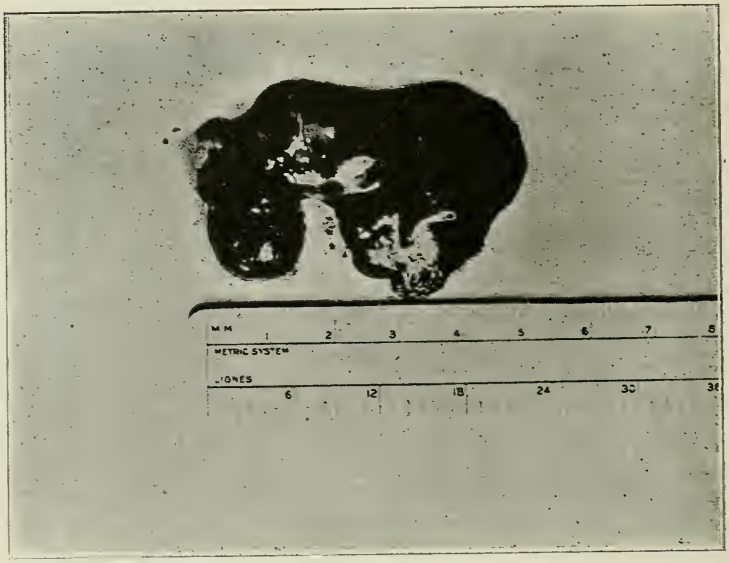
2nd. While it had a possible resemblance to an angioma, it had not all the physical features, nor the hemorrhagic history. Therefore, I doubted it being a true angioma.

3rd. I determined to make the necessary test as to whether it should be removed endo-laryngeal or through laryngo-fissure. That is to determine its possible hemorrhagic nature.

After examining the patient a second time, at my office, un-

der more favorable circumstances, and more thoroughly elucidating all the points I wished to settle, I cocainized the larynx, and then plunged a laryngeal knife well into the centre of the mass. I was gratified to find that my confidence was not misplaced, as only a trivial bleeding ensued. As a result of this examination an endo-laryngeal removal was decided upon.

On July 24, 1916, the patient was operated upon at the Episcopal Eye, Ear and Throat Hospital. All preparations




were made for any eventuality that might occur. The patient's pharynx and larynx were thoroughly cocainized with a twenty percent solution of cocain. The patient offered unexampled aid. Several attempts were made to encircle the growth with the wire of the snare, but the wire would not slip beneath the growth. As a last resort, I introduced my left index finger into the larynx, raised up the tumor from the left side of the larynx and forcing the wire around the mass, drew the wire taunt and then evulsed the mass. There was

very little bleeding—about a teaspoonful in amount. Immediate examination revealed that the growth had been removed in its entirety. Both vocal cords were visible in their pearly white appearance. The next day the line of attachment was readily recognized from the greyish white wound surface. This extended from the false cord upward along the ventricular wall to the border of the ary-epiglottidian fold, and posteriorly to and encircling the arytenoid, on the right side

The growth as removed showed a large pultaceous mass, of a bluish, grey mottled appearance. From the severed surface could be seen fairly large lymph or venous sinuses from which a syrupy bloody fluid could be seen to escape on pressure applied to the mass. The growth measured five centimetres in length, three centimetres in breadth and two and a half centimetres in depth.

After the growth was photographed by Harris and Ewing, it was submitted to Dr. John B. Nichols for pathological study. The report is as follows:

"Memorandum of microscopic examination of laryngeal tumor removed July 24, 1916, from Mr. Maurice Collins.

"The neoplasm is composed mainly of fairly firm fibrous tissue, arranged in the interior in plicated, branching and villous form enclosing an extensive series of cavernous sinuses. These sinuses, which account for the collapsibility of the tumor, do not seem to contain blood, and are, perhops, lymph sinuses. The tumor has a covering of stratified squamous epithelium. Peripherally (in the subepithelial zone) small blood vessels are plentiful. Large extravasations of blood are present in the fibrous substance, containing abundant pigment granules (not melanin). At a few small points the fibroblasts are closely aggregated, probably points of active growth rather than sarcomatous development. The tumor may be designated a hemorrhagic cavernous fibroma (or lymphangioma)."

When we come to consider the growth, we find several interesting features. The growth is of unusual size for a laryngeal neoplasm; its color and gross appearance made it difficult to reach a definite conclusion as to its nature; and the appar-

ent absence of difficulty in breathing with such a large neoplasm filling the whole vestibule of the larynx.

The method of operative procedure in dealing with this type of growth, especially the true hemagioma is only by laryngo-fissure. The endo-laryngeal removal is fraught with too great a danger to the patient on account of the severe, possibly uncontrollable hemorrhage, that might ensue. The elimination of the hemorrhagic danger in this case, through puncture of the growth was the only reason of my resorting to the simple and less dangerous method of endo-laryngeal enucleation.

### Discussion

Dr. John M. Ingersoll, Cleveland, Ohio: I had the privilege of seeing this case before Dr. Richardson operated upon it and I was very much interested in the report. I think Dr. Richardson is certainly to be congratulated upon the result he obtained. I also think that it took considerable courage for him to determine that the growth was not an angioma by making an incision in it. I discussed the case with him when I saw it, and we both wondered then what the outcome would be. We were naturally suspicious of malignancy. I never had seen anything like it before. The end result is certainly very favorable.

Dr. Emil Mayer, New York City, N. Y.: These cases are especially interesting. I think they show one particularly important thing and that is that the trained eye of the laryngologist sees at once that the diagnosis that is so often made in nearly every one of those cases is wrong and that the cases are not of a malignant nature. I can picture for myself the view that Dr. Richardson had of that patient, with a proper light, where he at once made up his mind that the original diagnosis of malignant disease which had been made was wrong. For that reason I brought up the question before, which was not answered, as to what the method was in the Institution of which the writer spoke with regard to attempting to remove a portion of the diseased tissue for diagnosis by the microscope, and whether in the opinion of those who are treating patients with radium this did not make for a stimulation of the disease, rather than for aiding in the treatment of the patient. As I mentioned, I believe that we can in most instances make a diagnosis macroscopically, and after all

the patient has not come to us for a fine scientific diagnosis but for help toward a recovery.

I must congratulate Dr. Richardson on his courage in putting in a knife to see if it was a bleeding tumor, and also on his successful removal of it intralaryngeally. The growth itself differs from most of the others on record, in that it was partially external and partially within the larynx. It is very remarkable that a patient with so large a growth should be able to get along without a great deal of dyspnoea. To my mind a case of this kind would be ideal for suspension. With very little effort one could draw the growth into a snare and remove it, and if necessary cauterize the place. In the case I reported a year ago the operation was done externally and the growth was removed and the mucous membrane sewed over. I am confident that that was the only way the case could have been treated, for the reason that it was below the false cord and not above it.

Dr. Henry L. Swain, New Haven, Conn.: With regard to the size of laryngeal growths, some of those present may recall a tumor which I removed in the same manner as Dr. Richardson did, the report of which appeared in our Transactions for 1892. This growth, however, was lower down than was the case of Dr. Richardson, and it still holds the record for size as far as I know in strictly intrinsic growths of the larynx. The growth was in the anterior commissure and began only slightly above the place where the two cords come together, so that more of the base of the tumor was below than above. When the patient came into my office one could see nothing but the growth upon expiration, but during inspiration this tumor would be sucked down so that the air could get by it. The patient had been living in that way with a very hoarse voice and with difficulty in breathing for nearly two months. He ran for a trolley car one day and fell down and was nearly asphyxiated, and related that to me when I looked down into his larynx. I trembled at the idea of getting it out. I had no idea of the up and down dimensions the tumor; the diameter as I looked down upon it was just what would fill the chink of the glottis, but the vertical dimensions were three times the transverse or side to side measurements. I told the man that if he was a good soldier I would try to take it out. He consented and having put cocaine in, I introduced a snare into the larynx. Twice I pulled and the growth came not, the man was getting blue in the face, so I put on a whole lot of power and got it out. I was more scared when it was finally out than I was before. It was a tremendous growth, much

larger than was apparent to the eye, and still holds the record for size. I was perapred for the eventuality of hemorrhage and told the man to throw himself forward with his head down on the end of a couch. He minded exactly what he was told and lay more or less on his head for three minutes, but hardly a drop of blood came away. He came back again on the third day and one could see then where the growths had been, just between the vocal cords. The patient had no recurrence.

As one views Dr. Richardson's specimen, one can hardly believe that a patient could have breathed with it in his throat and congratulate the operator for his courage as well as for his skill.

Dr. Charles W. Richardson, Washington, D. C. (Closing the Discussion): I wish to add just one word to Dr. Ingersoll's remarks, a point which he did not make quite clear. We were a little suspicious of the malignancy of this growth —in fact we could not quite eliminate the matter from our minds before we had the result of the pathological findings.

# SOME CLINICAL OBSERVATIONS ON THE LINGUAL TONSIL, CONCERNING GOITER, GLOSSODYNIA AND FOCAL INFECTION

GREENFIELD SLUDER, M.D.

Anatomical observation and description of the lingual tonsil was given by Wharton[1] and Morgani[2] and Koelliker[3]. Stoehr[4] gave its embryological development and histology in 1891.

The first clinical observation concerning it was recorded by David Craigie[5] under the title of lingual quinsy, according to Sir Henry Butlin[6]. Since that date a considerable time seems to have elapsed in which no observations on it are recorded. Clinical record of it begins again with McBride[7], Curtis[8] and Swain[9] (1884 to 1887) and since then it has made up a considerable literature; but even now this is very little compared with the writings upon the faucial or pharyngeal tonsils. This would argue its neglect or oversight by many observers who have contributed so much upon the other tonsils. This neglect is further emphasized by the very small consideration it has received from textbook writers.

It seems to me the lingual tonsil plays a far greater and more varigated part in the practice of laryngology than is generally thought. It is probably the most frequent clinical issue in the adult throat.

In my experience acute follicular lingual tonsillitis is not an infrequent accompaniment of acute follicular faucial tonsillitis in old or young, but is however, overlooked unless the examination be made with the laryngeal mirror. In patients who have had the faucial tonsils enucleated it may replace the acute faucial tonsillitis but is apt to be less frequently recurrent. Lingual quinsy is rare. The evidence of the acute lesion is striking, to wit, dysphagia, fever, redness and swelling of the mass at the base of the tongue with or without white or yellow spots marking the openings of the follicles. As the acute process subsides a widely varigated picture may

follow and endure apparently forever. Conspicuous in the symptoms of the subacute or chronic lesion is the sense sensation of mucus in the throat with or without swelling of the mass. There may be mucus actually, but frequently only the sensation which "cannot be cleared away by either up or down going efforts." This sensation moreover is often wrongly placed by the patient. Many times I have known the most intelligent patients to refer it to the nasopharynx and vigorously maintain they had to "clear something" out of the back of the nose. And I have known such patients treated for many years for "naso-pharyngitis." The reference of the sensation into the larynx is more frequent.

The sensation of pain in chronic cases is less frequent. In the subacute ones it may be present and located correctly or referred into the ear. It may be sharp on swallowing or be a sense of general stiffness and may exist with much of the local appearance (redness and swelling) absent. Such cases often pass as gouty or rheumatic throats. I have however never found a "gouty" throat with the lingual tonsil *normal:* and they have been uniformly relieved by local treatment of the lingual tonsil. I have seen such a painful throat translated as caused by the "small imbedded" faucial tonsil. It is of course disappointing to patient and surgeon when a perfect faucial tonsillectomy fails to relieve these symptoms.

The sensation of a foreign body is often described as "a lump over which my throat must jump in order to swallow." Allied to this is the sensation described by patients as "falling of the palate," or "elongation of the uvula." The uvula under these conditions may or may not be a little longer than normal.

The globus hystericus of classical description *may* exist. Most cases of this phenomenon however in my experience have been subacute or chronic lingual tonsilitis in easily excitable "nervous" people. This was also the observation of H. L. Swain, 1886.[9]

Cough is a frequent manifestation of all grades of lingual tonsillitis. Particularly annoying is that accompanied by a sense of a feather tickling in the throat which wakes the pa-

tient out of sleep, combined often with choking. It may possibly arise from contact of the enlarged tonsil with the epiglottis. It may be excited by laughing. The cough may be of any degree or duration. In the acute cases it may be intensely painful because the expired blast of air pounds upon the inflamed mass from below.

The veins of the lingual tonsil are a frequent point of bleeding in hemorrhage from the throat.

Enlargement of the mass may push the epiglottis down causing strangling in sleep should the tongue fall back even to the slightest degree.

The singing voice is frequently disturbed by, or lost, because of lingual tonsillitis. The complaint is frequently that "I am uncertain of my tone," "I sharp or flat" which is what singers often refer to as bad "placing." Attention was called to this fact by Holbrook Curtis, 1884[8]. It is also very destructive to the durability of the voice for singers or speakers. They can sing or speak for a few minutes only, when the voice gives way or cracks. This may happen because of the "stiffness of the throat," or because of the vulnerability of this inflamed district. It will not stand the work put upon it by such extra efforts. It is easily irritated and becomes uncomfortable or painful. The faucial tonsils are far less often the cause of or even party to these disturbances (at least in my opinion).

As a possible place of focal infection with systemic manifestations the lingual tonsil should be quite as carefully and as seriously investigated and considered as the faucial tonsils. I have often seen it reestablish the systemic condition "rheumatism" for which the faucial tonsils had been enucleate and I have seen that condition relieved by treatment of the lingual tonsil without the enucleation of the faucial tonsils.

As a factor in *thyroid gland disturbances* the lingual tonsil had not been recorded prior to my mention of it while discussing Dr. Shurley's paper before this Association in 1912. Seven years ago I saw in one of my own children (aged 4 years) the right lobe of the thyroid swell (to what appeared to be 50%) as an accompaniment of an acute follicular lingual

tonsillitis. The sore throat was only six hours old, more marked on the right side. She had never had tonsillitis of any sort before nor any disturbance of the thyroid. It behaved like the glands in the neck with faucial tonsillitis. The lingual tonsil and thyroid were apparently normal again in 10 days. The association of the thyroid with faucial tonsillitis was called to our attention by Dr. Theisen, 1904, and Dr. Shurley, 1912. With my associate, Dr. C. A. Gundelach in the St. Louis Children's Hospital, I have frequently seen this combination in children for whom the faucial tonsils had been enucleated long before. The clinical observation of this combination has been verified in adults by my associates Drs. H. E. Miller, C. H. Bardenheier, W. M. C. Bryan, M. F. Arbuckle and H. B. Miller. I know of no explanation to offer for it. The lymphatics of the lingual tonsil are not known. In early foetal life an association of the thyroid with the base of the tongue exists. This was described by Boehdelag[10] and His[11] as the thyroglossal tract. Sir Henry Butlin[6] thinks this explains the anomalously placed thyroid masses along this tract, which are sometimes met with. But he does not think that a thyroglossal duct has ever been proven in the adult. In an unsuccessful effort to prove a lymphatic connection, Dr. Gundelach and I have made a number of experiments painting the tonsil with india ink for two weeks prior to the removal of goiters of various kinds. The thyroids did not show the ink. It is an inoffensive procedure and patients do not object to it; but we have not had longer chance than two weeks. Were it prolonged into months it might answer better. We have also injected ink into the thyroid of guinea pigs and dogs but failed to find it transferred to the lingual tonsil. But this *clinical combination* together with the *satisfactory results of treatment* make me feel this report to be *justifiable.*

In cases of thyroid enlargement of moderate grades of almost any duration it has proven helpful to treat the lingual tonsil even though it appeared normal. (As a fact however it only very seldom has been normal. Often one lobe of the thyroid has been larger with a more marked lesion of the lingual tonsil of that side.) The goiter becomes softer and

then smaller. These cases are frequently accompanied by a low or moderate grade hyperthyoidism. This also is much relieved or cured. The sense of strength and endurance of the patient rises rapidly. Indeed hyperthyroidism may exist without external enlargement. In these cases the result of treatment is even more satisfactory. And in the few exophthalmic cases that I have had chance to observe some were much helped and one case was cured. The goiter and exophthalmos shrank rapidly. The weakness, nervousness, tremor, and frequent pulse were relieved. The case was apparently cured and has remained so for four years. It had lasted one year when treatment of the lingual tonsillitis was begun. It was six months in treatment, consisting of small applications of saturated silver nitrate to the lingual tonsil two or three times a week.

It is self evident that cystic degeneration of the thyroid will not be helped by treatment of the lingual tonsil. Sometimes however one is surprised to see an old hard fibrous enlargement soften and diminish somewhat under such treatment. For the worst cases thyroidectomy must serve.

As a factor in *painful tongue*, lingual tonsillitis has seemed to me to play a causative part. This distressing condition is described by Sir Henry Butlin[6] as glossodynia and he calls attention to the fact that the papilla at the junction of the palatoglossal fold with the tongue is very frequently inflamed in these cases. It seems to be a part of the syndrome. No explanation for this can be offered at present. Many times I have seen this papilla involved with pain in the tip of the tongue as a part of a lingual tonsillitis and remain so many months after the attack in the tonsil had disappeared. The lymphoid tissue of the tonsil often extends to this point. Recently I saw these papillae take part in the reaction from a galvanocautery destruction of the mass at the lowermost part of the lymphoid tissue at the base of the tongue one cm. to each side of the middle line.

The *diagnosis* of lingual tonsillitis is simple in acute follicular cases. Should it not assume the follicular markings it is often overlooked, particularly when the mass is not enlarged.

It is recognized under these conditions by its color alone. The mass may be much enlarged in acute or chronic cases which is of course easily recognizable. Not so easily interpreted is an occasional small slightly reddened follicle. These are often the origin of the symptoms.

The *prognosis* for singers and speakers according to my experience should be guarded. A lingual tonsil which easily becomes a disturbing factor either from the work of singing or speaking or from infection must be considered most seriously. I do not believe that the singing or speaking voice can be developed to any great extent under these conditions.

The *treatment* of lingual tonsillitis in the acute follicular stage is like that for the faucial tonsils under like conditions. For the subacute or chronic state with or without enlargement nothing has been so satisfactory as applications of a small amount of silver nitrate saturated in 50% glycerine. Salicylic acid saturated in 95% alcohol is helpful and does not taste so unpleasant. These may be made daily or as seldom as ten days. For the enlargement galvanocautery destruction has seemed best. Myles' lingual tonsil guillotine also serves well. Hemorrhage following surgery of the lingual tonsil is more difficult to manage than any in the upper air passages. It is fortunately rare.

I am aware that many of these observations have been made and recorded in more or less this form. The association of lingual tonsillitis with thyroid gland disturbance focal infection and with glossodynia I believe has not hitherto been recorded.

It is my interpretation of clinical laryngology that the lingual tonsil plays a major role. I am aware also that this is in opposition to the views of some of the most distinguished observers, notably Sir Henry Butlin, who expresses himself very clearly on this point.* I believe furthermore that many laryngologists share his views to a greater or lesser extent.

An extensive bibliography of this subject is found in Hymann's Handbuch d. Laryngologie, B. II, s. 638, "Die Krankheiten d. Zungentonsille" von J. Michael.

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## Discussion

Dr. Albert C. Getchell, Worcester, Mass.: I am very much interested and impressed with this account of the lingual tonsil. The disease undoubetdly has certain symptoms that we probably do not thoroughly appreciate. My experience with it has been varied. I have thought it had definite symptoms and then I have thought it had not. I would like to call attention to three points which have impressed themselves upon me: first, its relation to the nervous system; second, to hemorrhage; and third, to cough.

I think we all appreciate the fact that the symptoms occur most frequently in nervous people. I had an experience some years ago that impressed this fact on my mind very definitely in the treatment of a gentleman for the classical symptoms of the trouble. The condition was apparently extreme and the man was suffering a great deal. I found subsequently that during the time he was under my care he was under heavy financial stress, managing large affairs which were in a critical condition. I have seen him on various occasions since that time, and there has been no repetition of the symptoms.

Secondly, as regards hemorrhage, I think we should be very cautious about attributing to lesions of the throat anywhere the cause of hemorrhage, and I will cite this instance. It was twenty years or more ago that I had under my care a gentleman whose history was to me suspicious, but the family physi-

cian who sent him to me told me his general health was all right, and while I wanted an examination of the lungs, yet I did not feel free to make it. Now I should insist or not take the responsibility of the case. He had a moderate hemorrhage which occurred during the night, came to me the following day, and I thought I detected the bleeding point in the lingual tonsil. Subsequently, he saw Dr. F. I. Knight who found a well advanced pulmonary lesion. We know that this is not a rare condition although there is no history of illness. The patient was a spare built man, had engaged in a large business and at the time I saw him had retired from business. Still he had this pulmonary lesion, and as was the practice then Dr. Knight advised him to go to Colorado. In a short time he succumbed to some intercurrent illness.

The next point is cough. There is no question that trouble in this region may cause cough, but still I think that no continued cough should be attributed to such a lesion without a most thorough examination of the lungs. It has been my sad experience to see not a few cases that have been treated for a persistent cough by local measures directed to the throat, amputation of the uvula, removal of the tonsils, and treatment of the lingual tonsil, when it was evident that all the time there was a definite pulmonary lesion, and in many of these cases examination of the sputum without any examination of the lungs would have shown the real cause of the trouble.

Dr. Henry L. Swain, New Haven, Conn.: Having, as Dr. Sluder has kindly remarked, had my attention called to the lingual tonsil very early in my clinical career, I have followed up some facts concerning the lingual tonsil more closely than many of you perhaps, and found it very interesting to note how many times the sources of little lesions and the inconveniences that patients have suffered from, could be attributed to and explained by conditions found in the lingual tonsil. You take the question of the lump in the throat that we have all had occasion to feel under the unfortunate stress of circumstances of great sorrow, or profound emotion of one kind or another, and this is easily explained by conditions which exist in the lingual tonsil. The circulation of the lingual tonsil is peculiar; or rather, its relation to the veins of the base of the tongue is peculiar. The veins from the surface of the tongue gather together into certain large trunks which come together just in front of and dip down underneath the lingual tonsil. There is often some difficulty in explaining why a patient who is feeling perfectly comfortable

will all of a sudden feel a lump in her throat or a profound tickle. Why should it come suddenly and vanish equally suddenly? It is perfectly explicable when you consider the venous branches which gather together underneath the lingual tonsil. We have other examples of such physiological phenomena. We blush, and we do not do it with our toes, or with the backs of our hands, or any other part; we blush in our face. It has so happened through the ages that the physiological expression of emotion has been dilatation of the veins at the base of the tongue, giving us the feeling of a lump in the throat. I think this is just as proper an explanation of one phenomenon as it is of the other.

It is certainly a fact that emotional stress is sometimes evidenced by this feeling of a lump in the throat, and this anatomical condition which I have described may explain it.

In all cases of chronic cough, as Dr. Getchell stated, one is absolutely unjustified in treating the patient without inquiring into the condition of this tonsil. It is perfectly possible to have both a lingual tonsil cough and a bronchial cough existing in the same person. If you treat the bronchial cough and not the lingual tonsil, you are falling far short of your duty.

I am particularly pleased with the remarks concerning the case of exophthalmic goitre with lingual tonsil involvement and delighted that Dr. Sluder has recorded the observation that by treating the lingual tonsil he has benefited conditions existing in the thyroid gland. I am very sure I have seen and successfully treated numerous cases showing such a condition.

Dr. J. Payson Clark, Boston, Mass.: I have been interested in the lingual tonsil for a great many years. In the early nineties I read a paper on the lingual tonsil before a local society in Boston. My experience has been that the enlargement of the lingual tonsil is observed most frequently in middle-aged women. The enlargement of the lingual tonsil in children, in my experience, is a very rare condition. I remember one case very strikingly, a patient who came into the Boston Dispensary while I was on duty there. He came in with an acute enlargement of the lingual tonsil. I could not find any definite cause for it. There was enlargement and redness of the lingual tonsil. I found on questioning him that he had been chewing a great deal of a kind of seaweed—I do not remember the commercial name for it. With that in mind I thought there might be some iodine in this seaweed which had excited the enlargement of the lingual tonsil, and I got some of it, and had it examined by a

chemist. But the report I received from the chemist did not show any iodine.

I have had to remove the lingual tonsil in several cases and have used Dr. Myles' lingual tonsillotome. I have also used the wire loop. If the wire snare can be used it is better because you are less liable to have hemorrhage. I have not had hemorrhage in any of my cases. I remember being called late one night to see a case for bleeding where another physician had removed the lingual tonsil that day. The bleeding was not violent, but persistent, and I had a little difficulty in stopping it.

In regard to the relation of the lingual tonsil to the thyroid, I have seen no cases bearing on that point. But I think that the embryological connection between the base of the tongue and the thyroid is significant, and I have seen several cases, not very many, of a fistulous tract leading from the region of the thyroid up into the neck, in young people, which undoubtedly was a remnant of the thyro-glossal duct. These tracts are very difficult to treat and heal, because they are very fine and it is very hard to follow them up and dissect them out. In those cases it seems to me quite likely that islands of thyroid tissue may remain at the base of the tongue, which may become enlarged in disease affecting the thyroid gland.

Dr. Thomas Hubbard, Toledo, Ohio: With reference to the thyroid, I have under observation a case now which illustrates this point anatomically. It is that of a young girl who has a spindle-shaped cystic formation over the thyroid cartilage. It is apparently an unobliterated thyroid duct which is cystic. Furthermore, I think there is no question about the intimate association between acute throat conditions and acute thyroiditis. We find that in many cases in which we are able to successfully treat the throat it is most helpful in the resolution of the acute thyroiditis.

With reference to the presence of the linqual tonsil in children, I have recently had this matter called to my attention by a patient who was operated upon four years ago when he was six years old. At that time I had taken out the tonsils and adenoids and remember noticing particularly large lingual tonsils. He came back four years after operation and the mother said the child was half starved because there were so many articles of food which he could not or would not attempt to swallow. There was no acute inflammatory disturbance to account for it. On examination of the throat I found that the lingual tonsils were enormously enlarged and there was a contact ring of

lymphadenoid around the pharynx opposite the base of the tongue. There was no suggestion of recurrence of either tonsillar or adenoid tissue in naso-pharynx, but these large masses were a mechanical obstruction to swallowing. I clipped off portions of the lingual masses and all symptoms promptly disappeared.

Dr. Robert C. Myles, New York City: I appreciate, as we all do, Dr. Sluder's paper. There are several points about the lymphatic tissue at the base of the tongue. It seems to me that a very interesting one is whether the removal of the tonsils in early life does not, by some vicarious attempt on the part of the lingual tonsil to supply the physiological function of the tonsil, result in their becoming hypertrophised in this attempt. Of course we have not the comparative sizes of these tonsils previously in cases operated upon and not operated upon, but I think the enlargement is on that account. I have noticed a great many of them.

Another point in the removal of the lymphatic tissue at the base of the tongue. It has been my habit for many years to remove them in a little different way from that originally indicated. On account of some hemorrhages and cicatricial tissue I have tried to devise some method of obviating both; one was to take out every other lymphatic tonsil with a guillotine and leave an intermittent one. That aided me very much in relieving the scar tissue. I have also left islands of tissue. In using the guillotine one should not press too deeply. If you go beneath the tonsil you are more liable to have hemorrhage than if you put the proper pressure on the guillotine, which makes it possible to remove as much as you may elect.

Dr. Burt R. Shurly, Detroit, Mich.: The importance of this relationship of Waldeyer's ring to the thyroid is certainly a very exact and definite thing, but the key to the whole situation to my mind is infection. We know perfectly the immediate sequence of follicular tonsillitis and quinsy, as well as typhoid fever and other infections. These are definite things that are the most frequent causes of hyperthyroidism. We have an enormous number of those cases of low-grade hyperthyroidism throughout the State of Michigan. It seems to be something in the geographical distribution on account of the water supply or some peculiar condition of our part of the country. The number of cases of thyroid irritation are exceedingly common, and while my paper which was referred to by Dr. Sluder was

written five years ago, I have followed up carefully a large series of cases since that time, and I could show a great number who have been most wonderfully relieved of their degrees of hyperthyroidism and enlargement of the thyroid and thyroiditis with its periodic exacerbations by the removal of the faucial tonsils, and in that way preventing recurrent infection. I look upon it as a preventive, prophylactic and curative measure for those low-grade cases. Of course, as Dr. Sluder says, no one expects to treat cases in this manner and not have the proper surgery of the thyroid attended to when that is necessary.

In regard to cases of hemorrhage from the throat, I think perhaps there are a great many mistakes made by not properly examining the chest. We know full well that twenty-five per cent. of all cases of pulmonary tuberculosis have hemorrhage at some time or other during the course of that disease, and it seems to me that it is just a matter of not thinking of that. We should always have a very thorough and complete chest examination wherever there has been hemorrhage from the throat.

Dr. John E. Mackenty, New York: I believe that any infection in the throat may have secondary expression in the thyroid. This was brought home to me very forcibly by the case of a man with a foreign body in the esophagus. I put in the bronchoscope and failed to get the foreign body, but found the spot where the body had rested. This man was very ill with a high temperature and pulse and had an enlarged thyroid gland with acute thyroiditis. I was positive there was pus in the neck and opened the neck and went down to the esophagus but found no pus. I then opened the thyroid gland and in the centre of the gland there was a large abscess secondary to the condition in the esophagus.

On another occasion following the removal of the tonsil when there was a good deal of infection, the patient developed acute thyroiditis at the time of convalescence from this condition. So I believe we may say that any infection in the throat or nose may have secondary manifestations in the thyroid, either simple enlargement, or going on to the extent of producing abscess.

Regarding the question of bleeding from the lingual tonsil, I have found benefit from forcibly pulling the tongue forward and holding it in that position.

Dr. Max A. Goldstein, St Louis, Mo.: This interesting observation has called forth several thoughts about the linqual tonsil. In reference to Waldeyer's ring, I think it has been rather in-

significantly looked into, and Dr. Sluder's observation about the relationship to systemic infections taking place through this small lower lymphoid mass ought to give us much food for thought. We are doing a lot of operative work on the faucial tonsil and our enucleations are coming thick and fast. We know that even when the faucial tonsil has been thoroughly encapsulated, we do have recurrences of systemic infections, and it is likely that many of those infections come not through the lingual tonsil but through the lymphoid masses which lie about the pillars. There is some possibility that such observations as were presented by the essayist may give us an opportunity to think of this radical surgery when the time comes for the pendulum to swing the other way. To a certain extent the observation of Dr. Clark that the lingual tonsil is more frequently infected in adults and women is rather an inconsistency in view of our pathological explanation. If the lymphoid masses of Waldeyer's ring in front of the pharynx and in the faucial areas are sufficient to absorb and become obliterated after the age of puberty, it seems rather inconsistent pathology that the lymphoid masses should become more active at this period. But Dr. Swain has pointed out on previous occasions that the mass of lymphoid tissue is rather dependent for its pathology and inflammation more on the intense venous relationship than on the lymphatic. I think that varicosities are sometimes as frequent in lingual tonsil as are the acute and chronic follicular inflammatory reactions, but those are things this paper has brought forth, and I believe that the development of this particular phase of Waldeyer's ring will give us a little closer insight into the whole pathology of this lymphoid area.

Dr. Greenfield Sluder, St. Louis, Mo. (closing discussion): I feel that a very substantial addition of the paper has been given by Dr. Swain in his explanation to the globus hystericus. I did not know the network arrangement of the veins beneath the lingual tonsil, and it is not recorded in any of the anatomies I know of.

Dr. Clark spoke of the enlargement of the lingual tonsil in children being rare. That is not my observation. The enlargement of the lingual tonsil in children is a very frequent manifestation.

One of the speakers, Dr. Myles, I believe, spoke of the compensatory enlargement of the lingual secondary to faucial enucleation that follows particularly in children. I have seen the lingual tonsil take on the recurrent inflammatory reaction with sore throat after faucial enucleation.

Dr. Getchell and Dr. Shurly emphasized the fact that in cases of cough the chest must be investigated, which seems to me to be self evident. It is assumed in the management of the lingual tonsil, as in all other conditions of the throat where the patient is referred to us by an internist, that the question is asked if there be any further trouble and that there is a negative answer. Or, if the patient comes to us independently of the internist or otherwise, it should of course be our business to exclude other complications.

# SOME POINTS IN THE SURGICAL TREATMENT OF TOXIC GOITER

JOHN E. MACKENTY, M.D.

The subject here presented may seem somewhat removed from the accepted and orthodox conception of the limitations of rhino-laryngology. I must confess at the outset that an ulterior motive prompted me to select a theme apart from those usually debated in this Society; one, so to speak, lying upon the confines of laryngology. This choice was not made with the presumption that I could shed new light upon a subject so well illuminated by others, but more for the purpose of directing attention to a certain trend of events in the surgery of the neck. It is my firm conviction that the surgery of this complicated part of the body is rapidly becoming a specialty in itself, and will soon stand just as much of an entity as abdominal or gynecological surgery; this much I proclaim with little fear of controversion. I would add, and even venture to predict, that this field is open to the rhinolaryngologist if he but visualize the future and prepare for its fulfilment. But to qualify he must have special study in anatomy, pathology and diagnosis, and be backed by a large clinical experience. The neck presents many problems not entirely elucidated by a general surgical experience. The traumatic technique and indifferent anatomical knowledge so often met with in general surgery lead but to disaster when applied to operative work in the neck. Here there is no saving margin between safety and danger.

In a paper read before the Eastern Section of the Triological Society in March, I set forth arguments upholding my belief that the surgeons of the head (I feel that we are all agreed upon this larger term as applied to our specialty) have more than an equal right with the general surgeon to claim the neck as their legitimate field of endeavor. I do not speak lightly or without due deliberation upon this question of our right as rhinolaryngologists to qualify as neck surgeons. I

use the word "qualify" advisedly lest it might be inferred that being a rhinolaryngologist one must be, de facto, a neck surgeon. Ten years in general surgery and fifteen years in laryngology, all of which time I have been striving to qualify as a neck surgeon, have convinced me that the way is difficult, and that neither the general surgeon nor the laryngologist have yet fully awakened to the need of greater concentration upon this subject. To the younger men in our special ranks who have gained a general, as well as a special knowledge of surgery, I would address my appeal. To them the way is open to this larger field. But they must keep in mind that application born of a desire to succeed is the only royal road to success.

With this apology for presenting for your consideration a subject seemingly foreign to laryngology, I shall proceed to relate my personal views and experiences upon the surgical management of toxic goitre.

In the light of present surgical accomplishments in the cure and alleviation of toxic goitre it is equivocal, excepting in rare instances, to consider other than surgical treatment. The fight for this dictum is, fortunately for the patient, almost won. Yet the advocates of medical and serum treatment are by no means silent, forcing the conviction upon the unbiased mind that they must be pandering to the public demand for a non-surgical cure. Toxic goitre is a disease of exacerbations and remissions. Under any treatment, with rest as a basis, extended improvement, even simulating a cure, may occur. Upon this peculiarity of the disease all so called non-surgical cures rest, deceiving both doctor and patient. Pernicious indeed is the delay they engender. Profound nutritional disturbances, cardiac, renal and adrenal degeneration, nervous exhaustion, exophthalmus, impairment of vision, occupational inefficiency and many other untoward consequences attend upon this evil of watchful waiting. I do not, however, wish to be understood as advocating surgery in all cases. The thyroid overactivity of adolescent girls is no doubt often physiological and compensatory and requires nothing more than a careful mode of life for its treatment. Again we have cases of thyroidism

so mild that to operate would be taking an unjustifiable risk. These should be kept under observation. To operate at the terminal stage of the disease is to invite disaster and disappointment, since such cases may be suffering from the aftermath of past toxemia. In all progressive cases, short of advanced toxicosis some surgical effort should be made to stay the enevitable end. Boiling water injections into the gland; ligation of one or more poles; removal of half the gland with or without ligation of the remaining poles; removal of more than half the gland; are the procedures in their order of severity and risk to the patient.

In well developed and progressive toxic goitre nothing short of the ablation of from three-quarters to seven-eighths of the gland can be relied upon to affect a cure. The recognition and application of this truth has done much towards increasing the percentage of cures (1910 forty-nine per cent, 1916 seventy per cent). This may be done in stages or at one operation, depending upon conditions. It is here that one's experience is often severely tested. When in doubt the watchword should be caution. No operation should be considered until the patient is under observation in bed for a varying length of time, and has undergone a careful general examination. The condition of the cardiovascular system is a most important factor in determining the method of procedure. Perhaps our paramount responsibilty is in deciding when to operate. To make our attack at the beginning of, or during a period of relapse adds greatly to the danger of a lethal result.

On one's acumen in recognizing the best operative time during the remission and the operation best suited to the patient's endurance much depends. To larger experience in these factors we must attribute the tremendous lowering of the mortality in the past few years.

### *Points on Basal Metabolism*

Clinical calorimetry is now being applied to the study of toxic goitre. Recent studies in basal metabolism, i. e., the exchange of oxygen and carbon dioxide in the body have a most

interesting and practical bearing upon this subject. DuBois made a careful study of eleven cases of hyper-thyroidism and found the basal metabolism to be increased to fifty per cent or even seventy-five per cent above normal. Means of Boston, using a small Benedict calorimeter, has followed exophthalmic goitre patients before and after operation and has made observations upon the effect of rest, diet and X-ray treatment. In cases reacting favorably a fall of the basal metabolism occurred. It is probable that this aid to diagnosis and prognosis will soon be universally used by surgeons to differentiate between the rest and the active periods of the disease, and to accurately determine the degree of benefit from any applied surgical or medical treatment.

The dietary treatment of exophthalmic goitre has recently been studied by Janney (XXX) who has observed the effect of various diet regimens on the clinical symptoms, weight curve and nitrogen balance in metabolic experiments continued over many weeks. It was found that large increase in the food is necessary for the weight to be maintained without loss, in toxic cases. It was also shown that the toxic loss of protein could best be combatted by a mixed diet containing large amounts of carbohydrate, rather than by a high protein diet. These results are generally in accord with those obtained with the calorimeter.

We are indebted to the genius of Crile for bringing forcefully to the attention of the surgical world the dominating importance of fear as a lethal factor in the surgery of toxic goitre. In my experience these patients are so hypersensitive that only a small percentage ever muster up the courage to face an operation at the onset when a cure with small risk may be assured. To a considerable extent this handicap is lessening as our improved results are becoming better known and taken advantage of. My goitres of fifteen years ago were largely forlorn hopes. Now many incipient cases seek surgical aid. I cannot too strongly emphasize the importance of early operation. Both the minimizing of the risk to life and the greater hope of a permanent and complete cure speak loudly in its favor.

In only a few selected cases should local anesthesia be used and never for an extensive operation in any case. Even if the procedure can be made painless, the consciousness of what is taking place is much more harmful to these delicately balanced patients than the effects of a general anesthetic. The anesthesia should not go much beyond the threshold of consciousness and never to the depth required in abdominal surgery.

Rapidity of technique, if not combined with gentleness of manipulation is a much over-estimated virtue. Hyper-thyroidism and a varying degree of shock are always in evidence after a traumatic operation.

### *The Complete Operation*

By this I mean the removal of from one-half to seven-eighths of the gland. The skin incision should be wide enough to expose every step of the operation to easy inspection. Much time is lost (and sometimes much blood) by trying to work through a conservative opening. Digging for a goitre is not permissible. In all operations on the neck I advocate an incision so planned as to make the deepest structure appear as though it were on the surface. To obviate adhesions between skin and the underlying muscles the pretracheal muscles are divided at a higher level than the skin by a straight transverse incision. The sterno-mastoids are nicked, if they encroach upon the field of operation. Both superior poles are tied with silk. Here I consider catgut unsafe, as secondary hemorrhage from these greatly enlarged arteries, is almost certain to be fatal before aid can arrive. It is quite possible to unwittingly include the superior laryngeal nerves in this ligature, since due to the enlargement, this portion of the gland bears a varying relationship to its contiguous structures. Damage to the quality of the voice and trophic changes in the musculature and mucosa of the larynx may thus be caused. Post-operative voice fatigue may be a result of this accident.

Four important things must be kept in mind and must govern the procedures to be adopted during the remainder of the operation. They are: The parathyroids; the recurrent laryn-

geal nerves; hemorrhage; and the amount of gland ablation necessary to affect a cure.

*The Parathyroids*

Briefly stated these bodies may lie in, on or away from the posterior capsule of the gland. It is partly due to this variation that we have two methods of procedure, the intra- and the extra-capsular. Since it has been demonstrated that there are parathyroids in relation to the posterior capsule of both lobes, and that one or two parathyroids are sufficient to maintain function, our operation must bend itself towards the certain conservation of, at least, one of them. If only one-half of the gland is to be removed the capsule may be safely included. If more than one-half of the gland is to be removed then it is exceedingly risky to take the posterior capsule from the other side. Hence the operation leaving the capsule in situ has come to be the favorite procedure, especially since it is now deemed necessary to remove more than half the gland in order to effect a cure. Therefore, if the excision of three-fourths or more of the gland is our aim the posterior capsule must be carefully preserved on at least one side.

The recurrent laryngeal nerve lies in the groove between the trachea and œsophagus on the left side. On the right side it crosses the neck to reach the same position. This crossing is low in the neck, but in very large and submerged goitres I have seen it here exposed to injury lying in a transverse relation to the lower pole. In many cadaver dissections on this nerve I have observed a considerable variation in the manner of its entrance into the larynx, viz: lateral and antero-lateral. Again the nerve may divide on the trachea into as many as three branches, each going under the inferior constrictor at separate points. The more the nerve curves forward towards the front of the trachea the more is it exposed to injury, if not from actual section at least from pinching by careless hemostosis. Therefore two points in the course of the nerve must be specially guarded, viz: low in the neck on the right side and at its points of disappearance into the larynx.

*Hemorrhage:* The bleeding is always greater in operations which leave the capsule in situ. Indeed in very friable, soft and vascular goitres I seriously question the intra-capsular operation unless, besides tying the superior poles, a distal ligation of the inferior thyroid arteries is also done, thus cutting off all four points of blood supply. This distal ligation may be accomplished at the point where the inferior thyroid artery passes behind the sheath of the deep vessels. Blood conservation is of paramount importance and must, while the operation is in progress often change our preconceived plan of procedure.

When it comes to the estimation of the amount of gland tissue to be removed in order to effect a cure one is governed more by experience than by rule. In cases of mild toxemia at least one lobe should be taken, with ligation of the upper pole of the remaining lobe. In more severe cases three-quarters of the gland should be sacrificed leaving one lower quadrant. In severe cases only a small portion of the upper or lower pole (about one-sixth or eighth of the gland) should be left. After ligation of the four poles extenteration of one or both lobes leaving the posterior capsule covered by a thin layer of thyroid tissue may accomplish the same purpose. Here I would like to make protest against the almost universal custom of whip-stitching the raw gland surface together after exenteration. It is well known that resorption of thyroid fluids from the wound may greatly increase the post-operative thyroidarmia always present in more or less degree following thyroidectomy. From these traumatized surfaces much toxic material is backed into the circulation, if free exit for it is not provided. Therefore it is my custom after tying all bleeding points to leave these surfaces open and in thorough contact with external drainage.

Absolute hemostasis in neck surgery is difficult to secure. The high vascularity of the neck tissues, the determination of blood to the head during post-operative vomiting brings out bleeding points not seen during the operations. This is doubly true of all vessels requiring clamps. In other parts of the body only sizable vessels require tying. In the neck

and especially in the region now under consideration any vessel worthy of a clamp during the operation must be securely tied before closing the wound.

On one other point I would lay especial emphasis. In the light of my experience, this is more important than it may seem to many. I refer to the method I employ in draining the thyroid wound. The up-to-date surgeon abhors drainage and dispenses with it often to the patient's detriment. In neck operations the exudate is out of all proportion to the field involved, reaching to its maximum in thyroidectomy where, in addition, it is charged with a highly toxic element. Are we justified then for esthetic or cosmetic reasons, in adding one jot to the already too heavy load these cases have to bear, by not giving free vent to this fluid? Therefore I employ free drainage through a liberal opening. The pre-tracheal muscles are brought up and united. In the median line of the neck where the skin incision overlies these muscles a slit is made through which are passed two small rubber tubes open at the end only, one on either side of the trachea and reaching to the top of the operated field. Each tube is accompanied by a cigarette drain with many small punctures in the rubber covering. I have many times cut short a threatening thyroidemia by continuous saline irrigation through these tubes. The cigarette drains are removed in twenty-four to forty-eight hours; the rubber tubes when the thyroid exudate ceases to flow (from four to eight days). I have seen serious reactions in the hands of other surgeons due to their belief that the rationale of drainage in the surgery of toxic goitre is similar to that in other surgical fields.

Ligation is indicated in two types of cases; the very mild and the very severe. In the former it may suffice to effect a cure or at least a varying period of well-being. In the latter it never can do more than bridge a dangerous crossing to a more radical procedure. Here the surgeon should not wait for the re-establishment of collateral circulation before doing the more complete operation, for if he so delays, he must again face the original condition with no ligation possible by which to establish a second period of remission. The tying of

one pole may be done as a test of the patient's endurance. This is the operation indicated in bad cases as a preliminary to more radical measures. Here the margin of safety is reduced and the plan of operative treatment must also be reduced in its damaging factors.

### *Thyroidemia*

As a rule more or less thyroidemia is induced by even the mildest surgical interference. Its best treatment is its avoidance. In the presence of its most severe manifestations the surgeon is like a desert traveller in a sand storm. He does what little he can and hopes that the storm may pass away before life does. It may be fore-stalled by attention to the following points: careful preliminary treatment, rest, overfeeding, etc.; the reduction of a minimum of fear, light anesthesia, non-traumatic surgery, the judicious selection of the proper operation and correct time of operation; alkalies and water before operation, etc. When thyroidemia occurs my plan of treatment is to get water into the patient by all ways, alkalies, irrigation of the wound, and opiates to block off the nerve centres and to induce rest.

In my experience the following types of hyper-thyroidism are bad risks:

1. Where the disease is progressive in spite of rest.
2. Cases showing no remissions.
3. Appearance of psychosis.
4. Very active symptoms in cases with small glands.
5. Marked exophthalmus.

No case should, however, be refused some form of surgical help, providing it can be established that the disease is not in its terminal stage.

I beg your indulgence in presenting these haphazard remarks on so vast a subject as goitre. I have set down but a few points uppermost in my mind from a considerable experience in this field. My apology is that it is my earnest desire to focus the attention of rhinolaryngologists on the surgery of the neck and to stimulate greater endeavor on their part in this direction, so that we may witness, in the future,

no slackening of the expansion which has marked the past of perhaps the most progressive specialty of them all, rhinology and laryngology.

### Discussion

Dr. John F. Barnhill, Indianapolis, Ind.: A year ago before one of the sections of the Triological Society I read a paper on this subject and discussed the same points of anatomy. I gave somewhat similar reasons for reading the paper that Dr. Mackenty has given, and whether we wish it or not it is undoubtedly the inevitable trend of laryngologic practice to include the surgery of the head and neck. It is difficult to avoid it. I am one who believes that with such preparation as the essayist has just mentioned that good, if not better results, will be obtained than heretofore recorded by general surgeons.

The first point the doctor makes is as to diagnosis—not as to diagnosis of the fact that there is a goitre present, or of the further fact that there is a systemic poisoning present from the goitre, but as to the further fact as to all the things that may be the matter with the patient. In the first place, we have the circulatory disturbances, the heart lesions that we as laryngologists are not always capable of making out with exactness, which ought to be known before any operative procedure is instituted. This of course leads us into consultation with the best internists we have at our command because it would be a fatal mistake to attempt any sort of operative procedure in a case in which the heart is so dilated or hypertrophied as not to be able to withstand the proposed operation. Early operation here as well as in other kinds of surgery is essential to cure and great success. I think it is entirely true that the mortality from simple cases ought to be pretty nearly one hundred per cent. at present. The technic of clean neck surgery is so well worked out that the operation itself in non-toxic cases ought to be nearly without risk.

The doctor speaks very wisely of anesthesia. You who have been in Kocher's clinic have seen that he uses local anesthesia nearly altogether. Observation of these patients afterwards seems to indicate that they are greatly exhausted and excited at the end of the operation, and that it is not at all painless. As Dr. Mackenty has pointed out these patients are peculiarly psychic and susceptible to impressions and therefore we believe this anesthesia is a great hindrance to the their recovery. I know of no other operation in surgery, except brain surgery, where a competent anesthetist is more useful than in this operation. Dr. Mackenty just spoke of light anesthesia, but

it takes a trained anesthetist to keep a light anesthesia and yet one which is satisfactory; and so no one should ever attempt to do a goitre operation unless he had at his command a trained anesthetist.

Several points in regard to the operation. First, as to the parathyroids. I think the question is settled that it is known that a patient may live with only one parathyroid. It is also known that many persons have only one parathyroid. It is also known to you gentlemen who have dissected the neck, how difficult they are to find in the cadaver, and they are much more difficult to find during operation because of the presence of blood; every precaution must therefore be taken to preserve the parathyroids and this is best done by leaving a portion of the posterior capsule. The capsule in this operation I believe is the anatomical structure which must be borne in mind more than anything else, and if one loses his bearings and works outside the anatomical capsule he becomes lost and hence cannot be certain as to whether he will injure the nerve or remove one or more of the parathyroids. Therefore, the technic of his procedure must keep the surgical and glandular capsule in mind all the time, and if the operator works between these two structures it is almost impossible either to injure the recurrent laryngeal nerve, or to injure any of the parathyroid glands. Nearly always the parathyroids lie outside the capsule, sometimes inside; the recurrent nerve is always outside; therefore if you work between these two the operation becomes reasonably easy and entirely safe.

As to hemorrhage, of course, we must not have it. The patient is already, in toxic cases, is a poor risk and therefore clean and bloodless surgery is essential. Shock is not likely if you don't lose blood. It is just as easy to clamp the vessels as you go along as it is to wait and clamp them after bleeding has done harm.

The amount of gland tissue to be removed is a question that requires great judgment and it is here I think that consultation is often necessary. To remove three-quarters or seven-eighths of a gland that does not need that much taken away is a mistake. To leave it if seriously diseased is equally a mistake.

There is a certain class, Dr. Mackenty did not mention that class, in which this ductless gland is not the only one involved. The doctor did not mention that in dangerous cases there are often other glands involved along with the thyroid and if that fact is not ascertained before operation, and operation undertaken, the operator probably will have a death because

to remove a toxic thyroid does not cure such a case. In this class of cases, and I have seen it, you take away seven-eighths and the one-eighth left becomes so much hypertrophied that within a month or two the patient is worse than before. Here, then is another question for diagnosis and judgment. The main thing about it is that if other glands are involved, surgical intervention is not always indicated.

As to drainage what the doctor said is absolutely correct. It must be drained. The patient must not be traumatized in doing the work. The gland must not be handled or pulled up with heavy instruments by the operator or those helping him. It must be handled like a piece of glass because if there is toxemia there may be greater trouble after operation. But there must be a drainage tube. I have never used but one. Dr. Mackenty has used two; that is better.

One more point as to ligation. All of the surgeons use that in the worse cases and the mildest ones. It is all right in the mild cases, but I don't believe it is any better than removal of a part of the gland itself. It is proper of course in the worst cases because a little time is saved, and a little handling of the gland is prevented, and therefore there is less toxicity of the patient. But any of you who have tried it, and have held, like Dr. Jackson, a stop watch on your wrist will find, if you make a close observation of your stop watch, that to do this ligation is not a saving of time. You can remove two-thirds or seven-eighths of the gland as quickly as you can do a ligation, so it is not all one may think it is.

Dr. Thomas Hubbard, Toledo, Ohio: I want to bring up a phase of this subject which is especially interesting to laryngologists. One of the gentlemen mentioned interference with the recurrent laryngeal nerve. It is a fact as mentioned by Dr. Shurly that the lower lake region, including Indiana, is probably a great thyroid region, and laryngologists see many of these cases. Fortunately, most of the cases in which there is an impairment of the vocal action, improve within a reasonable time after operation. In others, a supplemental action takes place in the opposite vocal cord. Recently I saw a case in which a perfect operation was done as to the cosmetic results and effect on the health of the patient, in which two years after the operation this patient reported noisy respiration at night. Her husband told me that it amounted to roaring, not snoring, during sleep. It was a paresis of abductors in which there is inspiratory croup. Her voice is normal. In this case acute laryngitis with edema would be a very serious affair.

Dr. Harmon Smith, New York City: A few years ago one of the Mayos, I have forgotten which one, stated that there were an alarming number of paralyses of the recurrent laryngeal nerve in these cases. I asked every man in my clinic to take cognizance of all the cases and see whether the nerve was involved previous to, or during the course of the operative procedure. I have reached no decision which enables me to make any statement relative to the positive number, but a great many are involved previous to the operation. There was a paresis and not a paralysis, as Dr. Hubbard stated. I expect to make some reports relative to it in due course of time.

Dr. John E. Mackenty, New York. (Closing the Discussion): I wish to thank Dr. Barnhill for his very able support of my paper. He shows an intimate and practical knowledge of this subject. Regarding the degeneration, it is very important to know the exact amount of degeneration. In Dr. Kocher's clinic, I saw no painless surgery; they claimed it was painless, but the patients did not say so. The shock may be greater in local anesthesia than in general anesthesia.

Thymus enlargement quite frequently accompanies thyroid disease. I don't think that should deter us from operating in bad cases. I have operated in several cases where the thymus was enlarged.

The reason for two tubes is that when you take out more than half the gland you have the trachea dividing the drainage field and if you want to secure complete drainage you must place a tube on either side of the trachea.

I believe the involvement of the laryngeal nerve interferes to a considerable extent with the finer quality of the voice as in singing or public speaking. The finer modulations are lost.

In regard to recurrent paralysis, I have had no double paralyses in my cases. I have injured one side and have had impairment of the voice for a fair length of time which was always recovered from so far as ordinary speaking was concerned. If the patient is a singer, however, the voice would be ruined by injury of one nerve.

The Mayos report a lot of nerve involvement before operation. I have examined cases pretty carefully and have not been able to corroborate this. In a few cases there seems to be some lack of proper movements of the cords, but not to the extent the Mayos report in their examination of cases before operation.

# TUBERCULOMA OF THE TONGUE

CARL E. MUNGER, M.D.

It is with some hesitation that I report this case of tuberculosis of the tongue, for the reason that you are all familiar with the lesion and there is really little to say that has not been said many times before, but the case was so marked and caused the patient so much pain and distress that I thought it might not be at all out of the way to bring the case before you and note the peculiar symptoms belonging to the disease. Of course the principal thing in the consideration of any disease is its correct diagnosis and where is it more essential that a differential certainty be demanded than where the tongue is involved and where success in treatment is so dependent upon an early and certain diagnosis? In any lesion situated on a mucous membrane we at once say to ourselves, is this syphilitic, tubercular or malignant? Is this a condition to be treated medically or surgically and with what measure of success may we reasonably hope to treat it. When we think how exposed to traumatism and infecting causes the tongue is, it is perhaps remarkable that we so seldom see really serious lesions situated in the tongue, were it not for the fact that it is so abundantly equipped with a generous blood supply which allows it to fight so successfully against invasion. It is rare indeed that a tuberculous lesion of the tongue is a primary one although we might suppose that the organ could easily become infected from some external source of invasion; but most of the cases are accompanied with or preceeded by a pulmonary lesion more or less marked, and indeed ordinarily the lingual lesion would be but of minor importance were it not for the fact that it causes so much distress to the unfortunate possessor, not only on account of the physical pain but more especially the fact that it makes eating so difficult, that the possessor of this lesion cannot take a sufficient amount of nourishment, which is so decidedly

necessary to maintain the proper amount of nutrition. The patient A. B., age 30, came to my office Feb. 10, 1916, complaining of a sore tongue which had troubled him for three months. He appeared in fairly good health and had been at his work all of the time, which was that of bookkeeper in a large manufacturing concern. In fact he complained of nothing but the suffering occasioned by the lesion on his tongue, and was terribly afraid of cancer. He was under close observation for several days at the Manhattan Eye, Ear and Throat Hospital under the care of Dr. Harmon Smith, where the tuberculin and Wasserman tests were made and if I remember rightly were both negative, but the diagnosis was made that the lesion was undoubtedly tubercular. Further examination of the lungs showed that there was an extensive and progressing pulmonary involvement. According to Dr. Lyman of the Wallingford Sanatorium to which I sent him for treatment and rest, "his trouble was pretty generally distributed over the whole of both lungs, the only perfectly clear areas being in the middle of both sides behind and that the case was of an acute type and he could hope to do nothing to benefit him." He was under my observation for several weeks and then went to the sanatorium where he died May 8th, 1916. When I first saw him his tongue presented a crater like cavity situated on the dorsum, at the junction of the middle and posterior thirds in the median line, the pre-base of the tongue. At the bottom of the crater was a marked ulceration covered with a yellowish slimy secretion, and from the central ulceration were narrow sharply marked ulcerations radiating to the circumference of the thickened and indurated mass. The surface of the swollen mass was yellowish in color and there was marked and exquisite tenderness upon the slightest pressure, and there was much pain at every movement of the tongue. This pain was localized and not radiating when the tongue was at rest. The drawing which I show you presents a very striking picture of the appearance of the tongue except that the coloring is too marked. There was present also as the illustration shows, the condition known as black tongue the lingua nigra, this of course hav-

ing no bearing on the case whatever. As I did not see the patient again before his death, I take the liberty of reading the notes of his case sent me by Dr. Lyman:

March 15, 1916.—Pt. seen at my office Feb. 22, 1916; history of having always had slight hacking cough; hay fever every fall; present cough has persisted since last attack of hay fever 5 months ago; expect. slight; strength poor; tires easily, wakes flushed, 3 weeks ago sore throat; sticking pain over base of tongue on swallowing; small lump over base of tongue, first noticed 3 months ago; slowly increased; 2 months ago broke; line of fissure extending through the middle from before backward and across; sore has grown steadily worse in spite of all local treatment; pt. losing rapidly. Temp. 101.

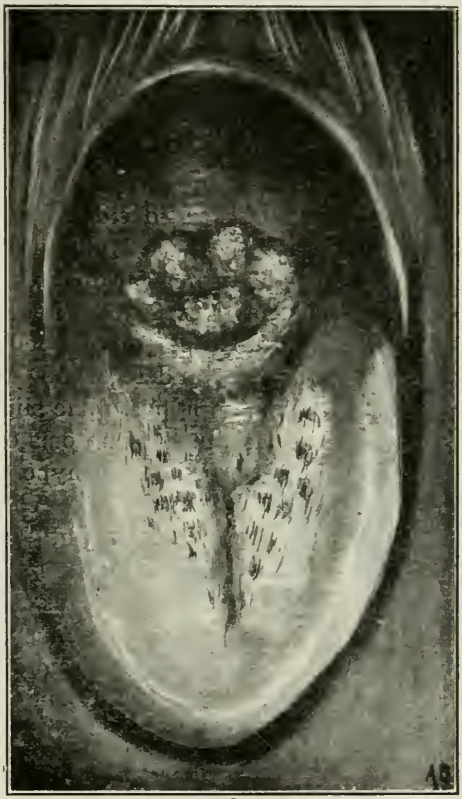
Lungs.—Right: Fair note; bg. somewhat impaired over lower lobe; marked mst. after cough over whole of front and to 6 v.s. and over lower third of back.

Left: Note and bg. considerably impaired with marked mst. over front and to 6 v.s.; slight base behind.

April 7, 1916. Patient since admission has been running a temp. 102-103; pulse 120-130; pulse and temp. both higher in past 10 days; has been getting tuberculin (MGA) locally on tongue every other day, no reactions; after 2 weeks changed to tuberculin (B) subcutaniously and locally; no reactions; tuberculin now being applied on wad of cotton packed into the ulcer in tongue and left for ½ hour every other day; pt. suffering much pain on admission and had terrific hard dry cough which was most painful, also considerable pain on swallowing; is now getting a spray of cocaine 1% to tongue immediately before food and morphine starting with 1-16 now increased to 1-8 gr. every 4 hrs.; ulcer in tongue has grown considerably larger; pt. has lost markedly in strength.

April 21, 1916.—Since last note pt's. temp. has been averaging 102 occasionally going to 103, pulse 120-130; it has become necessary to increase the dose of morphine from ⅛ to ¼ gr. q 4 h; with this patient is kept fairly comfortable; ulcer in tongue distinctly larger that at last note; this is treated every second day with tuberculin locally applied with medicine dropper, pt. is also given tuberculin once weekly sub-

cutaneously; for the past week pt. has great difficulty in swallowing; has complained incessantly of dryness and fullness in his throat, attempt made to see larynx was only partially successful as the epiglottis was the only thing seen; this was red and thickened.



Tuberculoma of the Tongue

Lungs.—Right: Poor note over side; bronchial breathing with whisper to 2R and over-prolonged expir. with iner. whisper to 4th spine; poor note over base; numerous fairly large and medium moist rales over side on bg. cough not attempted.

Left: Poor note; prolonged expir. to clav. poor murmur below 2R and over side, cough not attempted on account of laryngeal condition.

May 8, 1916.—Since last note pt's temp. averaged 102.5, going as high as 104 at times; pulse 120-130; ulceration on tongue spreading forward and becoming deeper; pt. still complains of great difficulty in swallowing owing to dryness of his throat, he has been averaging from 4-6 eggs daily, taken raw, and several glasses of milk; it has been necessary to increase the dose of morphine from grs. ¼ q 4 h up to grs. ⅓, and in addition to this codeine grs. ½ is given for hard coughing spells; for the past 3 or 4 days pt. has been very restless and his general condition has been decidedly worse; at times he was not responsible; for the past 2 nights has practically slept none at all, sat upright in bed all of last night insisting that his light should be kept burning that he might read; at 4.30 this afternoon pt. had hard coughing spell followed by very marked dysp., hands, feet and legs and ears becoming very cyanotic; 1-6 gr. morphine hypo.; some slight temporary relief for a few minutes; 2 hrs. later symptoms of severe dysp. again developed; pt. given 1-6 gr. morph. hypo.; the difficulty of pt's bg. and the sound produced in the chest while bg. suggested very strongly acute edema; about ½ hr. after last attack of dysp. pt. died.

As to the frequency of tubercular lesions of the tongue there are of course varying statements. In a paper written by Luigi Durante, he stated "as deduced from autopsy reports and clinical records, tuberculosis of the tongue is infrequent." Williyk (quoted from Von Ruck) says that in 1317 necropsies of tubercular subjects, tuberculosis of the tongue was found in 2 cases only. Fowler and Godlee (2) in 382 autopsies discovered it only 4 times. Fischer (3) three times in 1500 cases. Chiari (4) 12 in 625 autopsies. Adams (5) in 417 autopsies of tuberculosis found no tongue complications, while Von Ruck (6) states that 38% of 500 cases studied in Winyah Sanitarium were afflicted with lingual tuberculosis. The literature collected by Della Verdova previous to 1906 and by Durante (7) from Jan. 1, 1906 to Oct. 20, 1915, had references

to about 250 cases of primary and secondary lingual tuberculosis. It is not necessary to go further into statistics to show that a tubercular infection of the tongue is not of very frequent occurence. Whether the lesion is a slight ulceration or a large mass beginning to break down is probably a matter of degree and the diseased tissue is due to a tubercular infiltration and is not a true new growth although (8) according to latest investigation it has been found that when tubercle bacilli introduced into the lymph or blood circulation lodge on the wall, they are almost immediately taken up by the endothelial cells, causing them to become swollen. It is to be seen by this that the first reaction on the part of the tissue is a cell growth and not a cell destruction. "Butlin (9) has perhaps written as clearly and concisely on this subject as any one and I will call attention to a few of his observations. (A. Pathology) Inoculation may take place from the lungs by the active bacilli found in the sputa. When lupus exists on the face the disease is usually inoculated by contact. The lupus form of ulcer is nearly always confined to girls and young women whilst men of various ages form the greater proportion of the other cases. Even when the tuberculous cases occur late in the course of pulmonary phthisis men are usually attacked. This because of careless feeding, smoking, rough pipe stems, which either cause excoriations by burning or rubbing, or prolong the course of ulcers due to carious teeth or syphilis. Thus there are more often in the mouths of men sores upon which the T. B. can settle and upon which they will grow unless the tissues are too resistant.

(B) *Tuberculosis Nodes and Nodules.*—The earliest tubercules which have been seen have been yellowish projecting rounded points from 1 to 4 mm. in diameter. Such minute tubercles have been seen in the neighborhood of an ulcer and thus served to diagnose its nature. Tiny yellowish lumps or nodules are formed by the aggregation of tubercules, ranging from the size of a pin point upward to that of a pea. They are commonly seen on the sides or tip of the tongue. It is exceptional for them to pass on to the size of a bean or small nut without breaking down into an ulcer. Exceptionally the epithelium remains

intact. It is then necessary to distinguish a "tuberculoma" as it has been called, from a syphilitic gumma. In favor of diagnosis of tubercle will be the absence of signs of past syphilis and the failure of anti-syphilitic remedies. Evidence of tubercle in the patient, lupus or glandular scars and tubercle bacilli in sputum if there is pulmonary tuberculosis. Poncet describes an intra-lingual tumor, a "tuberculoma" appearing in a man 26 years old, as a tumor the size of a nut covered by normal epithelium. The sub-maxillary glands were enlarged, and the patient was said to have had a similar tumor removed 3 years before. Another case was that of a woman 24 years old under the care of Stoneham which had suffered from extensive lupus infiltration of the skin of the neck and chest mostly of the non ulcerating type. A tumor had been growing for 2 months on the left side and tip of tongue without causing pain. It reached the size of a marble with the epithelium still intact, when the contents began to ooze out. The tumor was completely excised by a V shaped incision and found to be a tuberculous mass, which had caseated and broken down in the center.

(C) *Tuberculous fissures.*—Tuberculous fissures are generally short, occuring at sides or tip of tongue often branched or stellate and generally single. In these respects they differ from syphilitic ulcers. The fissures are really fissured ulcers without vascular granulation, but with an indurated margin; indeed they may be described as a nodule with a chink in it. The appearance of the chink is deceptive until the edges are drawn apart when it will be found that the depth of the fissure is much greater than a superficial examination might lead one to suppose. It proves to be really a deep fissured ulcer with overhanging edges. Such a fissure may extend into the muscular substance without any surface extension. The sides of the cleft are prone to caseate and break down rapidly forming a foul and ragged surface exposed when the sides of the fissure are retracted. Indeed such fissures may be called tuberculous rhagades.

(D) *Tuberculous Papillomas.* This is an exaggeration of

the tuberculous fissure, in which the epithelial covering is raised into folds and between each of the folds are fissures. There is reported by Darier a case of a woman, 21 years of age, with extensive lupus ulceration of the face and neck with commenced at the age of 3 years. There were 2 Papillomatous patches on the tongue, with enlarged Submaxillary lymphatic glands. Typical tubercles undergoing degeneration were found in the interpapillary folds. (E) Tuberculous ulcers are described as surface uneven pale and rather flaby, graulated, often covered with yellowish grey viscid or coagulated mucus. Edges sometimes sharply cut, sometimes bevelled, seldom elevated or everted or undermined, not usually very red, but often redder than the surrounding tongue. There is little surrounding infiltration and there may be none. The adjacent portions of the tongue are generally a little swollen. Sometimes decidedly swollen and sodden. The outline of the ulcer has no characteristic shape, but the borders are often sinous and the shape is not unusually oval or ovoid or elongated. In the immediate neighborhood of the ulcer and perhaps extending for some distance beyond it are sometimes observed tiny yellowish grey points or patches or elevations or in place of these, minute ulcers, which in time increase in size. The depth of the ulcer varies much; in earlier stages superficial, but as the disease advances it may eat deeply into the substance of the tongue, and eating more deeply at one part than another may present different depths at different parts. There is almost invariably pain at later stages and almost always salivation. While the tubercular ulcer may be primary or secondary, a primary tubercular lesion of the tongue is is extremely rare although a few cases of tubercular infection of the tongue following traumatism have been reported. Speaking generally the tongue is more often inoculated from the lungs, than lungs or larynx from the tongue.

The case that I report presents a marked deviation from the usually reported situation of tubercular lesions on the tongue which have almost invariably stated as occuring either on the tip or sides, this one being on the dorsum, a site at which we usually find a gumma. Again the pain was, at least

at the time I saw the patient, entirely local in character and not radiating, and was absent when the tongue was absolutely at rest, in this respect differing from the peculiar pain of cancer. Apart from the interest of the case as being at least unusual are the deductions; first the diagnosis is at times difficult if not at first impossible. Second, the differences of the appearances in tubercular lesions of the tongue are differences in degree and not in character, and are really different stages of tubercular infiltration and ulceration. Third, the prognosis is not dependent upon the lesion itself but is influenced alone by the fact, is the patient suffering from concurrent lesions in other parts of the body which are not susceptible to improvement or in this particular case is the patient suffering from pulmonary tuberculosis, where there is a tendency to fibrosis. If the latter is the case there is a fair degree of certainty that the tongue lesion may heal either without local therapy, but if the pulmonary process is acute with caseation and necrosis active there is little chance of the tongue healing. Fourth, although a positive differential diagnosis between tuberculosis and syphilis of the tongue may not at once be determined, yet the difference between tuberculosis and carcinoma should be absolutely established and thus the most important question is this, a case of carcinoma or tuberculosis answered positively and if a cancer of the tongue the patient have his only chance of cure, early and complete excision.

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## Discussion

Dr. Burt R. Shurly, Detroit, Mich.: In a service of one hundred and fifty beds during the past six years in a Tuberculosis Hospital we have had two cases of tuberculous ulcer of the tongue. Both of these occurred in a far advanced condition. I have yet to see in my experience a primary tuberculous larynx, or a primary tuberculous ulcer of the tongue. Invariably those cases have shown some other activity somewhere, if it is looked for sufficiently and throughly. These two cases suffered the most terrific pain and had progressed so far that there was absolutely no chance of curing the patients. We simply cauterized the ulcerations and made use of orthoform and other measures for relief in the hope that they might comfort the patient and enable him to take some nourishment. In all these cases it seems to me that we ought to determine the relative frequency of bacilli. We do not do that. By this means the diagnosis is proved and syphilis is excluded. What seems to me marvelous is that we have few ulcerations on the tongue from the fact that the mouth in these advanced cases is absolutely alive with swarms of tubercle bacilli.

Dr. Thomas H. Halsted, Syracuse, N. Y.: I should like to report in this connection, the case of a girl 29 years old who first came to me seventeen years ago at the age of twelve. At that time I removed the tonsils which were tuberculous. A year or two afterwards the cervical glands, which were tuberculous were removed by another surgeon. Two or three years later she developed a mastoiditis, which I operated, and in the course of that developed a localized pachymeningitis. We thought it was tuberculous meningitis and expected her to die, but she recovered. Later on, in the course of two or three years, tuberculosis of the phalanges developed and was operated upon by a general surgeon. She then developed tuberculosis of the nasal mucous membrane which I curretted and treated with lactic acid for a number of months. Fol-

lowing this was a tuberculous ulceration of the alveolus and tongue which must be now four or five years ago. Later, within the past two years, there has developed tuberculosis of the nasal septum which has extended so that now it involves the tip of the nose, and it looks as though she will lose the tip of her nose. This girl, a seamstress, is, of course, living a fearful life with a great deal of pain in the mouth and tongue, nasal obstruction and ulceration and ulceration of the bony phalanges, but she is very hopeful for some new means of a cure. She feels that ultimately she will get well. In spite of all the multiple disease processes we have never been able to discover anything in the lungs. The diagnosis has been made through scrapings and the finding of the bacilli. The very interesting thing about this case is the long duration of the disease 17 years, and the number of lesions which have developed.

Dr. Harmon Smith, New York City, N. Y.: I would like to say a word with regard to Dr. Munger's patient. This was not a tuberculous ulcer nor fissure. It was in the median raphe, away from the border of the tongue where irritation of a tooth would make an ulceration. It was a fertile field and one where tubercle bacilli would grow. I saw it before it broke down and then it was a typical tuberculoma. After ulceration the granulations assumed more of a malignant character, so that one could consider it if not for pain, syphilis or a malignant growth; but with the intense pain, we ruled out the question of syphilis. Syphilis may have preceded it, but at the time we saw the patient there was no evidence of it. I think we should not confuse tuberculous fissures of the tongue and tuberculous ulcerations which occur on the border, with tuberculoma of the tongue. It was about the location of the taste beakers in the median raphe.

# BICARBONATE OF SODA IN ETHER ANESTHESIA

GEORGE B. WOOD, M.D.

In calling your attention to the use of Bicarbonate of Soda in ether anesthesia I realize that I am not presenting an entirely new idea but the results which have followed its routine use, in the lessening of post operative vomiting, have been so gratifying that I have ventured to bring this matter before you. Especially after tonsil operations, is checking of the vomiting desirable as the strain on the faucial wound not only adds to the discomfort of the patient but may be an important element in the causation of secondary bleeding. As a rule patients who have been given sodium bicarbonate before the operation, after having emptied their stomachs of the blood and fluid swallowed during the operation, do not vomit again and seldom complain of nausea, unless there is continued bleeding. Although there are occasional exceptions especially in adults, it is very uncommon for these cases to vomit after regaining consciousness.

This has been my clinical experience during the past year and a half in the use of bicarbonate of soda as a routine preoperative measure. To understand the mechanism of its action we must for the moment consider certain features of that peculiar metabolic disturbance called acidosis.

My interest in this matter started several years ago when I had an almost fatal result from acidosis following a very normal tonsil operation. I then had the urine examined in a series of hospital cases after tonsil operations and it was found that acetone was present in small quantities in about one third of the cases. This work was done by an interne at the hospital and unfortunately the records were not carefully kept so that the investigation is of little value except as a suggestion. However, in 1915 Bradner and Reimann[1] not only confirmed the possibility of a post operative acetonuria but found the percentage to be still higher. They reported the results of urine examinations following 214 operations and found acetonuria in 61.7 per cent.

Acidosis can be defined as an abnormal reduction in certain so called "buffer substances," the alkali reserve of the blood, most important of which are the sodium carbonates and next the sodium phosphates. These alkaline substances are salts of two very weak acids which acids in the presence of a stronger one yield their base to the stronger acid and become free in the blood circulating as carbonic acid and phosphoric acid. The acidity of the blood is greatly reduced by this exchange as the hydrogen on concentration of the weaker acid is much less than that of the stronger one. A further reduction in the acidity is brought about by the rapid elimination of the excess of carbonic acid from the blood by the lungs and of the phosphoric acid through the kidneys as acid phosphate. In this manner the alkaline salts of the blood really act as "buffers" between a sudden increase of acid and the organism, and they continue to do so until they have been reduced below normal limits.

The use of the term acidity in relation to the blood is a purely relative term, conveying rather an idea than an actuality. As far as any chemical tests can determine, the degree of alkalinity of the blood always remains the same even in the extreme types of acidosis. It is thought probable that the acid excess occurs only in the body tissue.

Until recently the diagnosis of acidosis has rested upon the clinical picture and the urinary findings. The symptoms of acidosis consist of a peculiar stimulation of the respiratory centers causing both deepened and quickened breathing, frequent vomiting with inability to retain anything in the stomach, headache, increased pulse rate, restlessness and marked general depression. Usually, associated with these symptoms, there is a peculiar fruity odor to the breath and examination of the urine shows the presence of some of the ketone bodies, usually acetone and diacetic acid. It is possible however, to have a greater or less acid intoxication without any of the ketone bodies being excreted in the urine, while on the other hand these acids may be found without any acidosis. The early detection of any alteration in the alkali reserve of the blood is very important as it is in the very

early stage of the condition that our therapeusis is most valuable. In prolonged and severe cases the body tissues are probably so altered by the acid excess in the tissues themselves that even when the blood has had its normal alkali reserve restored recovery cannot take place. We are therefore greatly indebted to certain modern methods of investigation which enable us to detect the very earliest changes in the blood itself. One of these devised by Van Slyke, Stillman and Cullen[2] measures the amount of the sodium carbonate "buffer" in the blood by determining the carbon dioxide capacity of the plasma and another devised by Levy, Rowntree and Marriott[3] estimates the hydrogen on concentration of the blood. The Plesch-Higgins and Marriott's recent simplification of their method is based upon the estimation of the carbon dioxide content of the alveolar air and Sellards determines the amount of soda that must be given to a patient to render the urine alkaline to litmus. The latter two are slightly less acurate than the first method but Marriott's method is more clinically available and does not require a laboratory expert.

For some time it has been supposed that the severe post operative vomiting which occasionally follows anesthesia was due to acidosis but only since the more modern methods of clinical study have been used, has it been shown that praeically all post operative cases in which a general anesthetic has been given are accompanied by a greater or less reduction in the alkali reserve of the blood.

Crile[4] in collaboration with M. L. Menten claims to have shown by experiments that "nitrous oxide, ether and chloroform during their administration all produce increased acidity of the blood." Crile further believes that emotion, operative trauma, starvation and infection, and in fact "every abnormal condition of the body whose origin can be traced to excessive kinetic activations" are important factors in the production of acidosis.

More recently Austin and Jonas[5] utilizing the Van Slyke method have made a careful study of sixteen cases of ether anesthesia and have shown that there is a depression of the

capacity of the plasma of from two to twenty volumes per cent. This depression they found was proportional to the duration of the anesthesia and apparently remains little altered for at least five hours. They state that the normal limits of the $CO_2$ capacity of the plasma, according to the Van Slyke method are between 65 and 80 volumes per cent and that below 55 the acidosis is such as may be found in advanced nephritis. One of their other cases reached as low as 47 and another 49. However, according to Morriss[6] it is probable that a lower mark than 30 must be reached before the acidosis produces any serious distress. Morriss's work which has just been published substantiates the findings of Austin and Jonas and he also found that chloroform causes a more profound drop in the alkali reserve than does ether, though either, after a half hour's anesthesia, notably depreciates the alkali reserve of the plasma. Acidosis itself, however, cannot account for all the vomiting of ether anesthesia. There is in certain individuals probably a special sensitiveness of the pneumogastric center on which the ether acts directly, and further it is possible that a certain amount of gastric irritation may result from swallowed ether.

However, with the knowledge that there is a positive decrease in the "buffer substances" of the blood as a result of the anesthesia, it is a perfectly rational deduction to believe that at least one factor in the post operative irritability and prolonged vomiting is a mild transient acidosis.

Recently it has been definitely proven that the alkali reserve of the blood can be increased by the administration of sodium bicarbonate provided only that the dosage be large and given at frequent intervals. Gettler and Lindeman[7] have shown that the maximum increase in the alkali reserve was obtained within 20 to 40 minutes after its administration and that after this it rapidly subsided although there was still some increase for 8 to 10 hours after the last dose. Morriss has been able in a case of acidosis during pregnancy to raise the carbon dioxide combining power of the plasma from 26.4 to 62.2 volumes per cent and in another case, probably of Weil's disease, from 20.6 to 80.6 volumes per cent. He has

also found that when sodium bicarbonate is given as a preoperative measure not only is the alkali reserve of the blood increased but also that its ultimate depletion is much less marked. Some patients showed no difference before or after operation, while the drop in the average case was about half of that shown by those to whom no sodium bicarbonate had been given.

As far back as 1914 Buckler[8] advocated the use of sodium bicarbonate as a preventive of post operative vomiting and it is now almost universally recognized that in those cases which either have acidosis or have shown a tendency thereto, it should be given before and after operation in sufficient quantity to keep the urine slightly alkaline. Although, Morriss in his conclusions says "The administration of this drug (sodium bicarbonate) before operation is a rational precautionary measure against post operative vomiting" he does not believe that the average surgical case requires it and prefers the routine estimation of the alkali reserve as a preoperative procedure. As applied to tonsil operations this routine examination is scarcely feasible because of the lack of laboratory facilities and trained men outside of a few thoroughly equipped hospitals. It is at least much simpler to adopt the use of sodium bicarbonate as the routine measure.

The administration should begin 24 hours before the operation of doses large enough to render the urine slightly alkaline and kept up to within two hours of the time of giving the anesthesia. With the sodium bicarbonate an excess of water should be given as dilution of the blood to the point of producing polyuria is another good prophylactic measure against acidosis. If in spite of the preoperative use of sodium bicarbonate severe vomiting or other evidences of acidosis follows the anesthesia, the drug should be continued preferably by rectal administration. Sometimes, however, the vomiting may be checked by a single dose given by mouth.

In this connection I would like to call your attention to two recent improvements in the administration of soda bicarbonate for the treatment of severe cases of acidosis. The first concerns the intravenous injection of sodium bicarbonate.

When carried out by the ordinary technic the intravenous injection of sodium bicarbonate may be exceedingly dangerous, as during sterilization of the solution the bicarbonate is largely converted into the carbonate, producing a highly alkaline solution. Magnus Levy[9] says that the sterile solution can be made safe by passing through it $CO_2$ gas until its reaction is nearly neutral with an hydrogen on concentration of about 7.4, which is analogous to the normal sodium carbonate-carbon dioxide buffer of the blood.

Gettler and Lindeman[7] believe that not only is blood transfusion exceedingly useful in acidosis but also that its value is greatly enhanced when the alkali reserve of the donor's blood has been raised by large doses of sodium bicarbonate given just before the transfusion.

To conclude, ether and chloroform and probably nitrous oxide when administered for over 30 minutes produce a distinct lowering of the alkali reserve of the blood, and it is probable that this mild transient acidosis is an important factor in the production of post operative vomiting. As the alkali reserve of the blood can be increased by the administration of sodium bicarbonate, it is a most rational procedure to use this drug routinely as a preoperative prophylactic measure.

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Discussion

Dr. Emil Mayer, New York City: I would like to ask Dr. Wood which dosage of bicarbonate of soda he finds essential in children prior to operation, that is, if one must start with

a certain amount of dosage, what practical dosage he has found beneficial.

Dr. Robert C. Lynch, New Orleans, La.: I had a sad accident occur to a member of my family which brought this subject pretty closely home and since that time I have used bicarbonate of soda as a preliminary to all ether anesthesias. Lately we have changed from bicarbonate of soda to citrate of soda as being a little bit more agreeable to the patients. We begin three or four days ahead of the time, that is preceding the anesthesia, and give doses of bicarbonate of soda or citrate of soda, five grains, and of the latter one quarter of a teaspoonful three times a day. In those cases where we are suspicious of an inclination of the patient to develop evidences of acidosis, we follow the anesthesia always with a Murphy drip, five per cent. glucose solution, one half pint. This gives our patients very much more comfort and freedom from vomiting. I think the facts brought out in the paper are extremely important. I suggested the plan three years ago to Dr. Beck who adopted it with the same success. We find that during the intense heat we see many more cases of acidosis occurring than we do in the Winter, and always during the Spring and throughout the Summer months when we submit a case for general anesthesia, we never omit the preliminary soda treatment and the post-operative five per cent. glucose.

We find also that the administration of codeine and morphine after operation will increase the quantity of acetone in the urine, and is disposed to precipitate the characteristic vomiting of these cases. Citrate of soda, grape juice, peppermint candy and glucose are our standbys.

Dr. George B. Wood, Philadelphia, Pa. (Closing Discussion): In regard to Dr. Mayer's question the dosage should be about a grain and a half to each year of the child, three times a day, beginning the day before operation and the last dose given about one hour before operation. I am not in the habit of keeping up the soda after the operation unless there is some evidence of acidosis. If symptoms of acidosis develop I use the Murphy drip.

Another point in the prevention of acidosis in children is feeding before operation. I have in mind the case of a little patient who nearly died because the family physician thought the patient ought to be starved. I think in children it is especially important not only to increase the amount of water the day before operation, but to see that the patients are well fed right up to within four or five hours of the time of operation.

# REPORT OF CASES OF BILATERAL ABDUCTOR PARALYSIS OF THE VOCAL CORDS

RALPH BUTLER, M.D.

Although these cases are not very rare, each one may present a wide and interesting field for investigation of the etiological factors involved. Moreover, in recent years, such a large proportion of papers and case reports have dealt with the important subjects of endoscopy, diseases of the accessory sinuses and tonsils, and new surgical procedures, that the writer felt that it might be worth while to call the attention of the Association to this subject.

Case I.—E. R., aged 11 years, presented himself at my office November 16, 1916, complaining of dyspnea and noisy breathing, with exacerbations of symptoms at irregular intervals, i. e. daily, weekly or once in several weeks. These exacerbations were precipitated by reading or writing but often occurred during sleep.

The attacks began with a short cough or two followed by inability to breathe, cyanosis and occasionally unconsciousness for a minute or two, and terminated with the expectoration of mucus. After the attack he was unusually nervous and irritable and occasionally he did not know that it had occurred. His breathing was usually audible but worse at times, especially at night, when it could be heard from the adjoining room. His voice was weak and he cleared his throat with difficulty.

Examination of his nose and throat showed a slight subacute naso-pharyngitis, a moderate backward tilting of the epiglottis with the vocal cords in the median line both on phonation and inspiration. Because of the position of the epiglottis and the irritability of the patient, it was impossible to see the cords during quiet respiration, but the moderately high-pitched stridor was constant.

*Family History:* The father contracted syphilis five years

before the birth of this child and a recent examination of his blood gave a positive Wassermann. The mother appeared healthy and one year ago her blood showed a negative Wassermann. There have been three pregnancies. The first child was born at term, but only lived a few days, during which time it had many convulsions. The second is the subject of this report. The third, one year old, was healthy and showed a negative Wassermann of the blood.

*Personal History:* The case under discussion had blebs on his hands and feet for several days after birth and the attending physician prescribed inunctions. He has had no convulsions nor loss of power in his extremities.

Dr. Theodore Le Boutillier reports that he has treated the patient since he was four months old, at which time he was a perfectly normal, healthy baby. There was a slight thickening at the anal folds, but not enough to call a true condyloma. He had measles, whooping-cough and chicken-pox.

At five years of age there was a swelling of the right thigh which was thought to be tubercular, but it cleared up rapidly after incision. At six years he developed ptosis of the right eyelid with internal strabismus and dyspnea. At this time Dr. M. F. Butler made several examinations of the larynx and always found the cords in adduction. Examination of his blood showed the Wassermann to be four plus. He had three doses of salvarsan and within a few months the Wassermann was reduced to "slightly positive" and the ptosis and dyspnea disappeared. A year later (Jan. 1913) the ptosis recurred. In September, 1915, the dyspnea recurred and has been present ever since. Several x-ray examinations of the chest have been made with negative results.

The parents object to a direct examination of the larynx and trachea and it has not seemed advisable to urge it on account of the extreme irritability of the child.

During the six months that he has been under my observation, the naso-pharyngitis has disappeared but the cords remain in the same position, except that there is a very slight abduction of the left cord during inspiration and the paroxysms occur less frequently. He has been on mercurials and

iodids intermittently since six years of age and developed normally until about a year ago, since which time he has lost eleven pounds.

*Neurological Report, April* 19, 1917, *by Dr. N. S. Yawger*

The child is intelligent but impetuous and irritable. The gait is normal and he is slightly ataxic with the eyes closed. There is paresis of the right external rectus muscle. The pupils are dilated equally, irresponsive to light and in accommodation. The upper extremities are slightly ataxic and the muscular power is fair. The biceps and triceps jerks are absent on the two sides. There are no sensory changes. In the lower extremities, the muscular power is fair and the patellar jerks are absent. There is no Babinski on either side and there is no clonus. There are no sensory changes. The abdominal and cremasteric reflexes are present on both sides. The bladder and rectum are continent. There are subjective pains at times in the arms and legs. The hand writing is normal. So far there appears to have been no syphilitic involvement of the brain or cord. The muscular atrophy is uniform and is due to the general debility.

The child at present does not have the symptoms of tabes dorsalis though there is a later possibility. We know that tabes is a common cause of this form of paralysis and that it may be confined to the abductors for years before the development of unquestionable symptoms of locomotor ataxia.

Gordon states that juvenile tabes has been seen in very young individuals and even in children of nine years, although only one case is on record with necropsy. Hereditary syphilis can always be traced in the family history and the Wassermann reaction is positive in a much larger proportion than in adults.

*Diagnosis:* The child has congenital syphilitic cerebrospinal meningitis. The ocular paresis results from cerebral meningitis. The abductor paralysis may be due to luetic changes in the recurrent laryngeal nerves.

Case II.—On January 23, 1917, I was called to see a patient who had just been admitted to the Polyclinic Hospital with

rather urgent dyspnea. I found a somewhat emaciated Jew with labored breathing, an anxious expression and slight cyanosis.

Examination of the larynx showed both cords dark red and slightly thickened. The left was immobile in the median line, the right abducted slightly on inspiration. He could not swallow solids but could swallow liquids with difficulty. The dyspnea was not sufficient to demand surgical interference, but the house doctor was directed to be ready for an immediate tracheotomy.

The following history was obtained. He was born in Russia 62 years ago. He has five children living and well. Three died when young from unknown causes. There was nothing in the history to suggest lues. The only sickness he recalled occurred when he was thirty years old, lasted two months and was supposed to have been typhoid. Although he worked steadily as a shoemaker, he was never robust and for many years, possibly since the attack of typhoid, he had been troubled with slight dyspnea when lifting or in the recumbent posture. About five months ago he began to notice an increase in the dyspnea, especially at night, and it was accompanied by pain in the throat and by dysphagia. These symptoms gradually increased until the latter part of last December, when he was admitted to the Hospital of the University of Pennsylvania, under the care of Dr. Husik, who reports that a view of the cords was not obtainable on account of edema of the larynx, that he could not swallow and breathed with much difficulty. The Wassermann test of the blood was made twice and was negative. His condition improved and after one month he left the hospital. Ten days later he was admitted to the Polyclinic Hospital as noted above.

After two weeks of rest in bed, with strophanthus for his weakened heart, his general condition, breathing and swallowing improved. He was then examined under local anesthesia by the direct method and the trachea showed a bilateral narrowing about three inches below the cords which were then slightly further apart, the right moving more than at the first examination. The stenosis seemed to be produced by

pressure on both sides of the trachea and presented a cleft about 5 mm. wide, extending anteroposteriorly. The mouth of the gullet was constricted.

The fluoroscope showed a large growth mostly on the right side of the trachea, extending from above the clavicle to the third or fourth dorsal vertebra. It did not pulsate.

February 29, 1917.—The physical examination shows the eyeballs small, pupils equal and reacting poorly to light and accommodation. The tongue is coated, many teeth are missing, and there is slight enlargement of the thyroid gland, especially on the right. In the centre and over the left clavicle are found small nodules attached to the thyroid. The veins are slightly distended. The right side of the chest is larger than the left. The heart is rapid, not enlarged and the first sound at the apex is impaired. There is slight anterior curvature of the spine. The breathing in the supraspinous fossae is harsh on the left and feeble on the right. The sputum is negative for tubercle bacilli. The extremities are emaciated. The liver and spleen are not enlarged. There is no edema of the legs and the knee jerks are feeble.

*Provisional Diagnosis:* Carcinoma of the thryoid gland.

After five weeks of rest in the hospital, he was strong enough to go home and report to the dispensary for treatment. His dysphagia and breathing were distinctly better, the right cord abducting as far as the cadaveric position and the left cord showed some bowing. Notwithstanding the three negative Wassermann tests, he was placed on mixed treatment for one week and inunctions for two weeks and gained eight pounds.

At this time the radiogram showed that the growth had decreased one-third in width. Three weeks later the roentgenologist reported that it was much smaller and that the esophagus was displaced slightly to the left. The growth moved on swallowing and with the heart beats but did not expand as an aneurism. The mediastinal glands were still enlarged.

May 4, 1917.—The patient is still taking a tonic and inunctions of mercury and his weight has increased fourteen pounds. He sleeps well and has no pain and no stridor even

on exertion but there is slight dyspnea on climbing stairs or rapid walking. He breathes more easily when in the upright position and with the head slightly forward. The voice is clear but rather weak and tires easily. The abduction of the cords is incomplete. Beginning with the first ring, the trachea is compressed bilaterally to 3 or 4 mm., the upper rings being plainly visible. As the tube passes further down the outline of the rings disappears, the mucous membrane being thickened and reddened, the lumen smaller and on reaching the level of the aorta the aspect changes in that there is a posterior bulging into the lumen, changing its shape to that of a crescent and reducing it to about the thickness of heavy writing paper. The bulging portion is deep red and pulsates synchronously with the heart beat. It seems unsafe to force the tube by this obstruction. Considering the almost complete occlusion of the trachea, it is remarkable that there is so little dyspnea. The nodules in the neck are small and do not seem to be growing. This case illustrates the possibility of both a laryngeal and tracheal stenosis occurring in the same individual.

I wish to refer briefly to a third case which I report from memory. Several years ago I was asked to see a woman about 40 years of age who had been operated upon for a very large thyroid gland. She was scarcely out of ether and was suffering from considerable dyspnea with some cyanosis.

An examination with the laryngeal mirror showed both cords in the median line with no movement except a slight flapping of the edges on breathing. I suggested a tracheotomy but the operator said it could be easily and quickly done through the thyroid wound and decided to wait. A few hours later, the dyspnea became more urgent and a tracheotomy was decided upon, but on changing the patient from the sitting to the recumbent position, she succumbed in spite of a hurried tracheotomy, demonstrating the too frequent error of postponing tracheotomy until the patient is almost exhausted.

A comparison of the symptoms in these three cases illustrates the variation in the severity of the dyspnea depending

upon the rapidity of the onset of the paralysis. Although the first two cases are in danger of death from asphyxia, they have been able to go about for many months with relatively little discomfort from obstructions which are little if any less than that which was fatal to the post-operative case in which the paralysis was very rapid in its appearance. Bert believes the greater mortality from sudden obstruction is due to reflex paralysis of the respiratory centres through irritation of the laryngeal nerves and Krieger maintains that it is due to irritation of the cardiac branches of the vagus.

### Discussion

Dr. Greenfield Sluder, St. Louis, Mo.: I would like to add the record of a case seen in consultation with Dr. H. E. Miller of St. Louis, a physician twenty-eight years of age who developed acute laryngitis, apparently a grippe, and with it a very violent dyspnoea which upon inspection showed bilateral posticus paralysis. The cords were almost in the median line. The glottis was represented by a slit through which you could have dropped an old time silver five-cent piece. The recovery was not exactly uneventful. It required some six weeks during which time he became excited about something and smothered almost to death. Dr. Miller got to him in time to do something for him. Nine or ten months later he developed another infection, laryngitis developed and again posticus paralysis. He did that a third time and through the three attacks I saw him in consultation.

Dr. Butler's cases don't impress me as being peripheral paralyses. The first one seems difficult to decide, but it seems to be the central origin of syphilis, if not tabes certainly some parallel process.

The report of peripheral posticus paralysis, so far as I know, is that single report. I was interested in the matter at the time and looked it up and we found no other reports that could be translated as peripheral paralyses.

Dr. Chamberlin: I have in mind such cases as occurring in the early stage of locomotor ataxia. My attention was attracted to this a number of years ago by a patient who was found unconscious in the street and taken to the police station on the suspicion of being drunk. After the usual delay it was discovered that he was not drunk but ill. On examination we found complete abductor paralysis and other signs

of locomotor ataxia. I then went over to the City Hospital and made a routine examination of all tabetics we had there and was surprised at the number of cases in which we received no history of this condition, where we found paralyses.

Some few days ago I had a patient, a man about thirty-five, an Italian, who came with a history of dyspnoea and difficult respiration, especially on exertion. I thought of course of the possibility of a foreign body, but examination showed bilateral abductor paralysis. I recommended operation and referred the patient to the hospital, but he disappeared. Some four weeks later the consultant told me that he found the man in an acute attack of dyspnoea from which he succumbed in a short time.

# OZENA AND ASPHYXIATING GAS. A NEW ETIOLOGICAL STANDPOINT

MARCEL NATIER, M.D., PARIS, FRANCE

I experience a double satisfaction in again reverting to the study of this subject, to which I have many times alluded in the past. Indeed I deem it a commanding duty, with my thoughts fixed on that gigantic struggle of the nations, which goes on unceasingly, without limitations, shaking the very fundament of the whole world from its most ancient until the present time.

Furthermore, there is a melancholy pleasure in adding a new link, quite unexpected, to the chief causes of a malady, into whose intimate nature I have given much particular attention for many years, for it so happens that it is one of the glorious victims of this war whom I have to thank for furnishing me with the theme of this communication.

Here is his lamentable history:

F., born in 1891, about to finish his military service when called upon for mobilization.

Father, workman, in the port of Dunkirk, sober, good health, died of anthrax.

Mother, 67, good health, excessively stout, no nasal affection. No consanguinity. There were six children, the oldest dying at two months. One brother had an affection of the lungs from exposure, and recovered, three sisters in good health, and the patient.

*Personal History:* Nursed by his mother, leaving his native town only when he joined his regiment; had no privations. From six to thirteen years went regularly to school. Employed in a silk-yarn factory until his eighteenth year. No overwork; but constantly exposed to dust. From the eighteenth to the twentieth year ship-carpenter, then soldier.

As a child, scholar, workman, soldier, always in good health,

no venereal affections, no headaches; his digestive, circulatory and nervous systems were absolutely normal up to the time of his injuries and asphyxiation. Respiratory system entirely normal, no nasal secretion or epistaxis, no sinus disease, no adenoids or tonsils.

*October 18, 1915:* He received five bullet wounds in his lower limbs. On the *right side* a superficial wound in the hip, one below on the calf and one much deeper in front of the tendon Achilles. *Left side:* Wound on the anterior portion of the abdomen, immediate expulsion of the projectile. Wound with an orifice below the knee, and on the external border of the left hip extending to and having its exit in, the inner part of the leg below the calf.

*Asphyxiating Gas:* Bombardment with asphyxiating bombs. ("Obus"). At first, owing to poor calculation as to distance, the bombs did no damage, and the odor was but dimly perceived. Subsequently by direction of aviators, this was rectified, and the bombs reached the trenches and great ravages ensued.

While in an open field, covered by the enemy's artillery, our patient was struck by an "Obus," and asphyxiated by the gas. He was not protected by his mask which had dried up. He fell like a log, asphyxia followed with total loss of consciousness for several hours. Eventually he regained consciousness, followed by renewed attacks of syncope.

After about thirty-six hours he was placed in a conveyance still clad in his clothes, soiled with vomitus and a great deal of blood. Blood mixed with greenish matter was not expelled except by hiccough. No evacuations took place. Coughing and respiration were impossible without most exquisite pain and severe burning in the stomach and chest. "Every effort of the kind tears my lungs," said the patient.

*October 19th:* The next day after the injuries he was transferred to Vitry le Francois, where he was obliged to remain for three weeks, owing to his febrile condition. Skin cyanotic, respiration prolonged with great agony, lasting at least

a fortnight. Almost total impossibility of respiration; each attempt followed by severe stitching pains, extending from the nose to the bifurcation of the bronchi. Receiving special care, dressing of wounds. Several injections of morphine and of serum; inhalations of oxygen, only two of these were given.

*November 11th: Arrival in Paris at Base Hospital.* Daily injections of normal serum and of morphine four times in the day, inhalations of oxygen, mentholated vaseline for the nose obstruction.

For the five months following the injuries there was much difficulty of respiration. For at least two months, inhalations of oxygen were repeated three to four times a day, ten to fifteen minutes each time, and though faintings often occurred after inhalations, they were followed by amelioration of symptoms.

Partaking of food by the mouth was absolutely impossible for the first six months, terrible burning in the throat followed attempts at swallowing, then dreadful vomiting from an intolerant stomach, even for milk and ices; so for two months irrigations of 250 grams of normal serum were daily performed.

There was a permanent febrile condition; total insomnia, intense feebleness, wasting cachexia.

*March 18th:* Admitted to the Salpétrière, service of Professor Dejerine. There was feebleness of external extremeties, intense headaches, respiratory troubles, ozena and vomiting reappeared for a month following electrical applications.

*Examination: Inferior Members.* All possible movements greatly reduced. Feebleness not marked on the left, while emaciation was greatest on the right. No hypotonia, no contractures, reflexes normal. Contractions of muscles normal.

*Upper Extremities:* Muscular power slow and weak, reflexes normal. Respiration rapid and irregular, 120, heart and lungs normal, pulse 104.

*August 4th:* Absolute uselessness of lower extremities, respiratory troubles diminished.

*August 22nd:* Strong faradic current. Galvanic current of 30 mp. followed by slight voluntary movement of great toes. Attempts to move the patient followed by tremor of hips. Some muscular contracture of hips but no movement.

*October 25th:* I first examined him. The two alae, more particularly the right, were strongly collapsed, remaining in contact with the septum; otherwise very mobile. In the left nasal fossa slight atrophy of the middle and inferior turbinates. Deviation of the right bony and cartilaginous septum; concavity on the left. Mucosa dry. Right side of nose, same condition as on the left, except for greater space because of the deviation. No trace of sinusitis. There was a catarrhal state of the vocal cords. Mucous membrane of the nasal fossa, markedly anemic; general sensibility normal, considerable diminution of odor; mouth perfect, dentition also; taste diminished, pharynx normal.

*Vision:* Bad on the right where nothing can be distinguished, left eye closed.

*Skin:* Normal, no excessive perspiration hands or feet, excessive perspiration in arm pits.

*Digestive Symptoms:* For a month after admission to the Salpétrière has been enabled to partake of food by the mouth, although he still has eructation and weight in stomach with some vomiting one quarter of an hour after ingesting food. Increase in weight and disappearance of constant sensation of vertigo.

From the beginning, intestinal evacuations only once in three days. Purgations ineffectual. No desire for evacuation and inability to pass gases from rectum. Enemata were resorted to; the patient did not even feel their being used.

*Nasal Respiration:* Complete stenosis from collapse of alae from the very first. If asleep with mouth closed, he also was promptly awakened by suffocation, so he became accustomed to place the ends of matches in his nostrils each night regularly to keep them apart. He was a constant mouth breather.

With the mouth closed respiration became jerky, waking or sleeping.

*Ozena:* Three to four months after the injury and for the first time there was a manifest alteration of the nasal secretion; yellowish at first, progressively becoming thicker and about one month later crusty and greenish.

Expulsion of bloody crust only after great efforts requiring hundreds of atempts for an hour; then they would eventually become dislodged.

Three weeks after this, he became aware of the bad odor of these crusts by the complaint of a comrade who repeatedly asked him if he had not "eaten cheese." It so happens that he never partook of cheese, hence his attention was directed to his ozena, although there was at this time a considerable diminution of the odor.

No olfactory sensation was awakened by inhaling eau de cologne which produced burning sensation of the nasal mucosa like unto that occasioned from holding a lighted match close to the nose. At the same time there was burning of the eyes with lachrymation, especially the right eye.

Progressive increase of ozena, more frequent use of handkerchifs, more frequent headaches especially temporal. The tongue is always burning with recurrent eruptions.

*Treatment of Ozena:* In February, at the first examination at the Salpétrière, I advised regular insufflations of warm salt water, which in spite of the nasal pain thereby occasioned, was followed by amelioration. There was a diminution of the amount and quantity of the crusts, which were now changed to smaller bloody "leaflets" or "balls."

*January 10th, 1917:* An abundance and the same fetor of nasal secretion; crusts formed, entered the mouth, and the patient being unable to expel them, were swallowed. For two weeks cessation of nasal irrigations because of severe pains they caused in the nose, with a resulting increase of nasal conditions because of drying of crusts. In spite of this, respirations seemed easier; need still to maintain nostrils

artificially spread or wakening with suffocation at night. More pulling sensation in the chest. Respiration decreased to 60.

*Special Alimentation:* Two litres of milk daily, four eggs and soft foods. Meat in small amounts and still more remarkable, veal alone was borne. All other meats, ragouts, or sauces with onion, caused a disturbance in the stomach soon after their ingestion, hyper-secretion as of boiling water, very acid; the tongue became as on fire and covered by numerous white elevations. The same fiery sensation of the lips, accompanied by a more or less confluent eruption.

The very hard masses were expulsed every two or three days at the cost of pain and agony each time, sufficient to bring out tears.

Spontaneous evacuations returned for the past month, since when gases passed freely from the rectum, and sensation returned to his hips. Enemata produced pain and rather than submit to their administration preferred to make efforts to evacuate his bowels by the hour.

*Inferior Extremities:* Sensation entirely absent following injury shows a tendency toward return since about the past two months, plainly limited on each side to two-thirds of the upper part of the hip.

At the junction of one-third of the inferior portion there is a ring surrounding the member; palpation on the surface produces a sensation of pricking instead of the simple sensation of contact.

It seems as if the hip were attached by a cord that was being tightened.

Walking always impossible, or with slight progress. Attempting to walk, the legs were projected in advance.

This inability could in no wise be imputed to any unwillingness on the part of the patient, who receiving no visitors was actually grieved to remain fixed in one place, and was very happy to be able to visit his comrades.

*Vision stationary.*

*March, 1917:* Though slowly, the ozena is improved with the general improvement. (This observation is of interest from several points.) The affection has shown an exceptional if not unique course.

Before the injury, not the slightest pathologic condition of any susceptibility to predispose to an offensive nose. This young man in the state of blooming good health, now bore every sign of that offensive condition.

We are justified then in directly tracing the causal factors to the asphyxiating gas and the subsequent functional disorders, an ozena purely accidental and at the same time so rapid in its existence.

No less curious is the pathogeny.

Above all we note it often to occur after luetic affections. Bearing in mind my studies of the question, and which I do not retract, I have not changed my original views relative to the origin and development of ozena. To those who have forgotten, or who have not been informed of my views, it will suffice to state briefly that in my opinion Ozena is not a true morbid entity, an idiopathic or real, but a unique and always a symptomatic expression of a profound localized disturbance of the general health.

Now in what manner does this recorded case confirm and illustrate these deductions? That is what I shall now attempt to demonstrate.

Ordinarily ozena is considered inseparable from old and far advanced atrophic rhinitis. The disagreeable symptoms I have already previously stated is the ultimate end of a disorganization, slow and profound of various constitutional mucosa elements. Blood vessels, nerves, glands, muscles, cartilage and even bone of the nasal fossa. Similar disorganization results in a physiologic change of unusual severity of variable causes, going back often to the first years of life. That is the general rule. We must allow for exceptions. The case here recorded belongs to the former class. The atrophy is simply developed. On the contrary, on the other hand, the ozena is of recent date, is excessively pronounced, and follows almost suddenly in an adult subject. Where is the

contradiction? Only in appearance; the difference is in the cause and the affection is the same.

In my patient, the determining cause was at the time sudden and violent; the effect cruel and deplorable. That the unfortunate man at the arrival of succor did not succumb immediately or in the general delay, is marvelous. How many others, so stricken would have been able to return to normal equilibrium except at the price of most laborious exertions?

A young colleague, recently seen, tells me that he has never seen a case of gas asphyxiation that did not produce pulmonary tuberculosis. An experience of thousands of others. Less terrible proves to be that of my soldier. His unfortunate history in that sad physiologic loss, substantiates my views, in which I persist more than ever as to the causes of all ozena.

Here viewing its nature and course, the first cause determined, the stages were particularly rapid. A wealth of evidence that the disturbances so marked of the respiratory and digestive tract prove my contention that Ozena is nothing but the manifestation consummated and localized in a special part of the body, an anatomic physiologic evidence of the profound disturbance of the mucous membrane of the economy of the whole body.

*Prognosis:* There is not the slightest doubt. It can only be favorable. No irreparable lesions, only functional disturbance. They become less progressive, and follow the general improvement. We may count upon radical cure in accord with the latter statement.

*Conclusions:* An ozena plainly of sudden origin in an adult, after grave functional traumatism, a great wound, following asphyxiating gas. The rapidity of the progress is easily explained by the disorganization at once profound and general of the surface affected.

Once again it is verified, and supports the assertion that ozena is but a consequence, distant more often but also under color of exceptional events of the physiologic calamity.

The cause of the latter is of less importance. Its intensity merits consideration.

This truth admitted and its verity visibly impresses me, we are compelled to discard, as I have always done in my studies of the subject, the various theories, more or less fantastic and in particular the microbic theory, invoked to explain the production of ozena.

Logically the clinical appearance and that only, is the guide for our information that we must be istructed in the real cause of the grievous affection, which is the object of this present communication.

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2. Ozena and Respiratory Gymnastics. (Trans. Amer. Lar. Asso., 1910).
3. Ozena, Nutrition and Respiration. (Ibid., 1911).
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# A CASE OF PRIMARY ROUND CELL SARCOMA OF THE NASAL SEPTUM

MAX A. GOLDSTEIN, M.D.

Malignant growths in the nose may originate in the ethmoidal labyrinth, the palatine process of the superior maxilla at the junction of the floor and septum or on the septum. The latter site of origin is more common for the primary sarcomata, the spindle cell and round cell varieties being about equally divided as to frequency of occurrence. Of 80 tumors of the septum tabulated by Arslan twenty-nine were sarcomata, eleven were carcinomata and the remainder consisted of various other varieties of tumor.

The patient, J. A. P., 56 years old, first came under observation July 25, 1916. His complaint was nasal obstruction which had first become definitely evident about five months previously, in February of the same year. At the time of the examination both sides were obstructed, the left much more than the right. His family history did not elicit any important facts. His father had died at the age of 62 of dropsy; his mother died at the age of 85 (cause unknown). There was no cancer or tuberculosis in the family, so far as the patient knew.

The patient himself had never been sick before and gave no history of syphilis. He was a hard drinker.

The first symptoms dated back eighteen months when he began to be troubled with occasional obstruction of the left side of the nose. This obstruction would continue for about a month followed by spontaneous relief, then it would recur. Up to the time of examination the patient had never had any epistaxis. Since then two or three nose-bleeds, not very profuse, had occurred. No headache or pain of any kind. Slight nasal discharge. There had been a loss of 15 lbs. in weight in the course of six months.

Examination of the nose showed a mass on the septum oc-

cluding the left side. The mucous membrane of the right side of the septum was infiltrated and thickened causing some occlusion also of the right nasal fossa. There was no involvement of the antra or other accessory sinuses, so far as could be determined, and there were no symptoms pointing to such involvement. The pharynx and naso-pharynx were negative. There was no metastasis or evidence of tumor growth in any other part of the body.

Operation was performed September 26, 1916, the mass together with the entire septum, mucuos membrane and all, being extirpated. (Specimen shown).

The question as to whether this tumor was or was not a chondrosarcoma was settled by microscopic examination of a specimen taken from the excised tissue, cut in cross-section. This showed the perichondrium entirely innocent of involvement in the tumor formative process. The histological picture of the mucosa was that of a typical round cell sarcoma. (Specimen shown).

Within a month after operation recurrence was noted beginning in the vestibule and this increased rapidly so that obstruction almost as bad as before operation was present again.

The patient was lost trace of and I have not heard as to the outcome of this case since.

### *A Case of Laryngo-Epiglottidean Cyst*

Frank D., 12 years old, came under observation September 27, 1915. The boy had been hoarse since he was one month old. This hoarseness had been ascribed by family physician to a "cold." No laryngological examination had at any time been made. The condition seemed to remain quiescent all these years until shortly before the boy was brought to me for examination at which time he had become very dyspneic. The dyspnea was quite marked; patient anemic and frail, not cyanotic, and unable to speak above a whisper. There had not been much difficulty in swallowing. No regurgitation of food. Examination of nose and naso-pharynx was negative. Laryngeal examination showed a mass the size of a walnut on the left side involving the laryngo-epiglottidean region.

There was no fever. Mass was yielding to touch and could easily be palpated with the finger. Mass incised, the contents consisting of clear, yellow, sticky fluid. Subsequent examination of vocal cords, examination of which was heretofore impossible because of obstruction of view by the mass, was negative. Boy regained the use of his voice though through habit he would speak in an undertone. No recurrence of cyst to date and boy now speaks in normal voice.

# FINAL CONCLUSIONS REGARDING AMPUTATION OF THE EPIGLOTTIS FOR TUBERCULOSIS

LORENZO B. LOCKARD, M.D., F.A.C.S.

At the meeting of the American Academy of Ophthalmology and Oto-Laryngology, in 1909, the author presented, for the first time, a statistical study of the cases of tuberculosis upon which amputation of the epiglottis had been performed.

The following conclusions were then advanced:

"I believe it can justly be claimed that by this operation we save a certain number of lives that otherwise would most certainly be sacrificed; that in a vast majority, when a cure is not to be thought of, we effectually conquer the pain, and that we succeed, even in those in whom the suffering is not entirely controlled, owing to the presence of complicating lesions, in diminishing it to a notable degree."

In 1911 a supplementary study was presented to this society, in which his views were summarized as follows:

"These statistics warrant the unequivocal assertion that amputation should be performed in every case of involvement regardless of the extent of the disease, local or constitutional, when odynophagia or dysphagia exists and can be ascribed, even though only in part, to the epiglottis; that it is likewise indicated, and should be performed at the earliest possible moment, in every case where there is anything beyond a sharply circumscribed focus, whether or not odynophagia exists, provided there is even a remote possibility of arrest of the complicating lesions. If the accompanying processes are advanced to a stage where arrest is impossible, amputation should not be performed unless the lesion gives rise to otherwise uncontrollable pain."

In the years that have since elapsed a very large number of operations have been performed, and numerous reports received from operators throughout Europe and America, hence a report embodying an opinion regarding the real therapeutic status of this mooted procedure may not be without value.

I am further impelled to the making of this report by the circumstance that despite the wide circulation given these and similar papers, there is still a lamentable lack of precise information regarding the real objects of the operation, its indications and limitations.

Particularly is one impressed by the prevalance of the idea that the procedure is a dangerous one, *per se*, not to be undertaken unless there is reasonable assurance of complete and permanent arrest of the disease, both local and constitutional. This idea is evidently premised upon the additional assumption that unless this object is achieved the final condition of the patient will be greatly aggravated, a theory absolutely untenable.

Amputation of the epiglottis is as safe a procedure as tonsillectomy. In over four hundred cases, in the majority of whom vitality was reduced to the lowest ebb, not a single direct fatality resulted. In five cases considerable bleeding occurred but this was controlled without great difficulty.

Next to this, the objection most frequently advanced is that no operative procedures are justified unless the lesion is so circumscribed as to be capable of complete excision. That this also is usually fallacious has been definitely shown.

When the operation is undertaken with the hope of achieving a cure this desideratum is of considerable importance, but it must be borne in mind that in nine cases out of ten the sole object is palliation, and usually in patients upon whom all other methods of treatment have failed.

Even when a cure is considered possible, removal of all involved tissue is not invariably essential to success. It has been demonstrated repeatedly that when an epiglottis is universally infiltrated, and only the upper half or two thirds is removed, the stump rapidly recedes to normal. It is rare that the disease recurs in the stump. The author has shown by microscopical studies in a number of cases that after partial removal of an epiglottis, even when all other parts of the larynx were diseased, that no evidences of tuberculosis were present in the stump two months after operation.

Healing of the stump is usually rapid and complete regardless of the extent or rapidity of progress in the complicating pulmonary and laryngeal lesions, hence the question of advisability of operating in this manner hinges upon two questions; in incurable cases what amount of relief may be anticipated, and in cases otherwise hopeful, what influence will the operation have upon the accompanying laryngeal lesions?

The effect upon the pulmonary disease is, of course, only indirect and concerns the ability or inability to take sufficient nourishment. Anything that impairs this ability naturally causes rapid progression in the general disease and vice versa, general improvement will be more probable if the ability to eat and drink be fully restored.

A number of patients are living upon whom the operation was performed from ten to twelve years ago, as a palliative procedure, and in whom the resultant unexpected improvement in lungs and larynx was so complete that eventual arrest ensued.

One case of extensive laryngeal and pulmonary involvement, operated upon in 1902 lived until 1916, when he died of spinal tuberculosis; a second, with universal laryngeal involvement, second stage pulmonary tuberculosis and tuberculosis of the epididymis, made a perfect recovery so far as the larynx was concerned, and lived for four years when he died from extension to the kidneys; a third, who had an Omega shaped epiglottis, infiltration of the right arytenoid, ventricular band and aryepiglottic fold, associated with large cavities in both lungs, and a general ichthyosis, made marvellous improvement after the operation, performed six years ago, and is now a college lecturer.

A considerable number of cases, of which these are typical, might be recorded, and while in no way indicative of the usual course run by these cases show the occasional brilliant results achieved even in the apparently hopeless. They also demonstrate the fact that a definite prognosis cannot be made, and that when all simple procedures have proved unavailing, radical interference is justified.

The improvement in accompanying lesions can be ascribed

in large part to the same influence that occasions pulmonary betterment; the removal of pain, increase in nourishment taken, improved sleep and lessened cough.

Another important factor is the increased accessibility of the larynx to treatment. After the epiglottis is removed it is often easy to destroy by galvano-cauterization lesions that were previously completely hidden. It is a fact that a surprising subsidence in these accompanying processes is -frequently observed.

The chief indication for amputation, however, is and must remain, the relief of pain, without thought to the eventual cure of either laryngeal or pulmonary disease. In this field brilliant results are frequently obtained. The failures that are occasionally met do not militate against the general advisability of the operation for the reason that when the pain is not removed, it would have been present in any event and the patient's condition is in no wise made worse.

There are necessarily many cases in which a combination of lesions exist, any one of which might in itself give rise to odynophagia or dysphagia, in which no one can foretell the exact role played by any one or more. Thus, with an edematous arytenoid, aryepiglottic fold and epiglottis, the pain might exist in equal degree if any one of the three conditions existed by itself. In such instances one cannot say with any degree of certainty what benefit will follow removal of the diseased epiglottis.

If it is diseased by itself, the lesion will not only be cured but the pain permanently removed. Therefore it is strongly advised that in every case of tuberculosis limited to the epiglottis, whether the organ be involved in part or in its entirety, that it be amputated, or at least that the diseased section be freely excreised. If other sections are involved, and pain exists, the diseased epiglottis should likewise be removed. In such instances the pain is overcome in a large number of cases while in many others it is lessened to a marked degree.

One of the most surprising things in surgery is to witness the sometimes complete disappearance of pain after this operation even when other vulnerable points are involved

Such relief, while oftimes temporary, is not infrequently permanent.

The one great contra-indication, in the author's experience, is that form of epiglottic involvement, either infiltrative or ulcerative, in which the process is beginning to involve the base of the tongue or the pharyngo-epiglottic folds.

These progress so rapidly to a fatal and painful conclusion that operation offers no prospect of either arrest or palliation. If temporary relief be obtained it is of so fleeting a nature that it is no compensation for the nervous strain and discomfort of the operation.

Such lesions, if incipient, are easily overlooked, and may be betrayed by nothing more than a slight fullness or puffiness, hence very careful inspection is demanded.

The entire lateral walls and base of the tongue may and usually do break down within a few weeks after the very first signs of disease become manifest. In these cases only is amputation absolutely contraindicated. In all others, if pain exists and is uncontrollable by other treatment, excision is advisable. No bad effect upon the general health has been observed. Complete anesthesia can be obtained and the operation itself need not, in the average case, require more than a half minute.

There is little pain from the wound itself, and usually the relief from the previous suffering is so marked and immediate that it at once outbalances the soreness occasioned by the incision.

Exhibit 1

## REPORT OF THE COMMITTEE REPRESENTING THE AMERICAN OTOLOGICAL SOCIETY, THE AMERICAN LARYNGOLOGICAL ASSOCIATION, AND THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY TO THE COUNCIL OF NATIONAL DEFENSE

Having been asked by the Council of National Defense to suggest in which way the nose, throat and ear specialists of the societies mentioned can be of use to the Army and Navy Medical Corps, we feel that we can suggest the following:

We recommend that all the members of the American Otological Society, the American Laryngological Association, and the American Laryngological, Rhinological and Otological Society be requested to become members of the Medical Reserve Corps of the Army and Navy, or of the Officers Reserve.

In the first place, the members of these societies could examine recruits for the aviation service, in testing the condition of their labyrinths.

In the second place, we could be of service in examining the upper air tract of recruits, especially in cases of hoarseness or other suspicious conditions which might evidence the possibility of tuberculosis.

In the third place, we could be of service in examining all recruits in whom there was a suspicion of impairment of the hearing, or in which there was any evidence or suspicion of the infection of the middle ear, either acute or chronic. We recognize the importance of excluding chronic suppurative ears, from the experience of the British Army.

We could be of service in the organization of a base hospital for the treatment of cases of injuries and diseases of the eye, ear, nose and throat at the base of military operations or elsewhere.

The younger man or junior is the physician under thirty-five years of age, and the consultant or senior is the physician over thirty-five years.

It is advised that the younger men be utilized for active service in the base or other hospitals, and that the older men be utilized as consultants for one or more base hospitals, or a group of neighboring hospitals.

It is advised that a list of the Naval and Base Hospitals, and Naval Training stations be obtained, and a list made of the consulting specialists. This list is to be placed in the hands of the Army and Navy officials in order that in case of need the required specialists may be assigned to the various hospitals. The names of these specialists are to be chosen by a committee from the three special societies represented by this committee.

We would like to call attention to the necessity of testing the hearing of men in military service in order to ascertain the type of impairment of hearing that will exclude men from certain forms of service, yet permit them to engage in other forms; and to formulate and publish these tests for the use of the consulting military throat and ear specialists of the country.

We recommend that men furloughed from the front, having affections of the nose, throat and ear, be referred to some distinct hospital and some designated physician in connection with that hospital, in order that the physician may keep in touch with the soldier or sailor until he is sent back to the line of service.

(Signed) CHARLES W. RICHARDSON,
Representing the American Otological Society.

(Signed) BURT R. SHURLY,
Representing the American Laryngological Association.

(Signed) HARRIS P. MOSHER,
Representing the American Laryngological,
Rhinological and Otological Society.

## Exhibit 2

That the Committee appointed to meet the Council of National Defense be empowered to consult the Surgeon Generals of the Army and Navy, for the purpose of requesting that the Medical Officers of the Officers' Reserve Corps of this Society be employed, so far as possible, in the line of their specialty, and that it be suggested to them the advisability of establishing one or more base hospitals devoted to injuries of the head and air passages and diseases of the eye, ear, nose and throat, acquired in service; and also that this Committee be empowered to take up any question that the Surgeon Generals of the Army and Navy or they may suggest, for the interests of the members of this Society, in connection with the present War, and that the attention of the Surgeon Generals of the Army and Navy be called to the action of the joint meeting in regard to the examination of aviators and the employment of hospitals and their staffs for this purpose.

## Exhibit 3

At a conference of the sub-committee on Ophthalmology and the sub-committee on Laryngology, Rhinology and Otology of the General Medical Board of the Council of National Defense, it was decided to offer the following suggestions to Major Lyster for the consideration of the Surgeon-General of the United States Army:

It seemed desirable that each general hospital unit have a head hospital in the ratio of twenty per cent of beds to the general hospital.

That the personnel of that section include one brain surgeon and four assistants, one chief ophthalmic surgeon and two assistants, one chief nose and throat surgeon and four assistants; and that pathologists, roentgenologists and neurologists be supplied from the chief unit, by the chief of said unit to the head hospital.

It is also suggested that one optician be assigned to each group of base hospitals.

It is further suggested that four ophthalmologists and six throat, nose and ear surgeons be assigned to each division of the mobile army.

### Discussion

Dr. Charles W. Richardson, Washington: I would like to make a few remarks especially in relation to the medical service of the Army. I have been requested to say a few words by Major Noble, if it meets with the approval of the Society.

In this connection I wish to state certain facts in regard to our own medical service—those of the United States Army. I am not speaking by authority for that service, but I am speaking for that service to a certain extent. It is a well-known fact that the men in the medical profession of this country are not coming forward at this period of our national distress to the extent that they should. The older men, the men over the age of forty, have been supporting the cause to a greater extent than the younger men. Therefore it is the voice and wish of the medical officers of the United States Army, the Surgeon General and his Assistants, that the members of this Society should go back to their homes and enlist the support and voluntary enlistment of the younger men into the corps of the Army, so that every interest will be supplied. In October they will need ten thousand medical men. At the present time there are only about two thousand one hundred and forty-two officers of all ages; fifty per cent. of those are men over forty-five years of age.

We, as citizens of the United States, have benefited to an unusual extent from our citizenship in this country, more so than citizenship in any other country as individuals. We have profited by this; our success has been great, our comforts save been manifest, and it is no more than right that we should assume the duties and obligations of citizenship, and offer our services fully to our country, and encourage all those with whom we come in contact with this spirit of enthusiasm. We must stand, gentlemen, for our country, for democracy, and for the suppression of this horrible war, as soon as we can, and by giving aid and comfort and doing our utmost by enlisting ourselves and causing others to enlist we can bring this about.

Dr. Harris F. Mosher, Boston, Mass.: I wish to add a word to the remarks of the two previous speakers, which may not ring true with the tone of what they have said. I was very much pleased to be put on this Committee and to be elected

by the Council of National Defense to suggest in which way the specialists can be of use to the Army or Navy. I did what I could in helping for that Report which has been read to you to-day. Since that report has been in I have been increasingly unhappy. I am unhappy to-day, and I am not the only one here who is unhappy. I feel in a measure having signed that report like a slacker. That comes from this point. You will notice that in the very beginning of that report the men who signed the report said: "We advise all members of these three societies to join the Officers' Reserve Corps or the Army Reserve Corps." There are very few of us who have joined. And why have we not joined? Why I have not joined is this. I am far away from the general surgery with which I began, far away from general medicine which went along with my general surgery. I feel that I am more at home in the specialty which we all practice. I feel that I will be of more use in that specialty, and I stand ready, and you stand ready I feel, to aid in any way by practicing that specialty. But you cannot practice that specialty at the present time if you go into the Officers' Reserve Corps, or its corresponding corps in the Army or Navy. What the government asks of us to-day is a wholesale coming into their ranks without any reservation whatever. They say they can make no promises. On the side they intimate that perhaps, probably even, the special man will be used for special work, but no promises are given so that you have to make up your minds whether you will go on with the feeling of a slacker and wait until you are asked to do special work, or go in to-day and run your chance of being put to work with which you are unfamiliar. The only way out of that is to say in this uncomfortable position until some action is taken toward the forming of a special base hospital. When you read the report, if you do, you will find that was recommended. If you talk with the men from Washington you will find they feel that will come. Major Lister said that will probably come if Pershing carries over the amount of men he is supposed to carry over, within the next six months. Until that time I am unhappy and I feel very many of you are unhappy. I don't know what to do. It is a much easier thing to go in and a much harder thing to stand out. I for one am going to stand out until the time comes to go in and do the work I think I am more able to do.

Dr. Robert C. Myles, New York City: This is a problem which must be solved and this Association should assist in doing it. About ten years ago I had a skeleton of a bill which went before some of the members of the United States Senate

and to Congress, asking them to pass a bill in which the specialists of eye, ear, nose and throat could be utilized by the United States Army and Navy. I thought the bill might be passed at once if we could get the consent of the Army and Navy Medical Corps, but did not think this would be possible. At that time I came to Atlantic City with Dr. Stokes, the Surgeon General, and fortunately secured a room with him, and discussed this matter with him for two days. He seemed to think it was a very good thing; all the arguments I used he said were feasible.

I dropped the subject finally because it was a very delicate one, because we were trying to attach ourselves to something belonging to the United States Government, and the method of attaching ourselves without interfering with any of their plans seemed to me almost too delicate to approach. Now, the matter has come out exactly as Dr. Mosher has said. It sems to me we cannot stay out. We must go in and give our aid. I have had some very peculiar experiences lately at the New York Polyclinic where we have three hundred specialists and a lot of them have joined this corps, and I wish you could see some of the work they are doing. It is so far removed from their specialty that they know nothing about it. It is simply ridiculous. I don't know what I could do if I was sent down to the Mexico border to treat dysentery. According to what we hear, that will all be corrected later. There ought to be some action or activity, some Committee formed or appointed with a Medical Officer to plan some law to relieve the situation. The eye and ear are two of the most important organs in war.

Dr. Joseph H. Bryan, Washington, D. C.: This is a very important matter for us as citizens and as specialists, but we must remember that we are at a very grave crisis, and every man, young and old, every woman and every child has got to come forward and do something. This is no child's play. This is war. According to the best thinkers and the best observers it is not going to be over this Fall, this Winter, or even next, and every resource of this country has got to be ultizied. I have gone into the Officers' Reserve Corps, having served some years ago in another branch of the service. Of course, it is a very hard thing to do, to go in and abandon the care and responsibilties I have, but nevertheless I feel that having served once it is my duty to go there again. I have gone in voluntarily and am willing to accept any position. I have accepted a subordinate rank; I can serve as captain just as well as major, and am perfectly willing to do that, but we

are all in bounden duty to do something to help out in this crisis. On the other hand, I think if the matter is brought very forcibly to the attention of the Surgeon General of the United States Army these various Societies, representing that men of experience, men who have developed these specialties of the eye, ear, nose and throat, are best fitted to work in the base hospitals or some hospital devoted to the treatment of diseases resulting from such injuries, and that they can best serve their Government if their services are utilized along these lines, I am sure the Surgeon General will treat you courteously and possibly do something along those lines. Of course you must remember that the war department has been working on a basis of a hundred thousand men and has got to work now on a basis of over two million men, and it has not got the system or force to combat these difficulties. They are swamped with work at present. But if we will take the stand and assert that our services are best utilized along the lines on which we have been working, I believe some impression will be made upon them. In the meantime we can all go in and serve our country to the best of our ability.

Dr. Burt R. Shurly, Detroit, Mich.: There are now thirty-seven base hospitals organized, or in a state of organization on the Red Cross Service; there are also a number of base hospitals in the regular Army. Each of these base hospitals is entitled to one or two specialists on the Staff with the rank of Captain, of eye, ear, nose and throat, to support these base hospitals, both of the regular Army and of the National Guard, and of the army of conscription and of the Red Cross Base Hospitals. It will undoubtedly be necessary to establish a number of base hospitals of eyes, ear, nose and throat. We have one by way of example in the British Army now located at Folkestone which has done very wonderful service for the British Army. If we could have a base hospital on the foreign service, and one in this country, or more as will be necessary, and organize the eye, ear, nose and throat hospitals of the various large cities as they are already organized, and have a definite method of referring all cases from these 500 bed general base hospitals to the special hospitals, we would undoubetdly be able to organize and establish a wonderful service for the Army of the United States at home and abroad. It seems to me that this scientific usefulness simply requires organization and authority. Without the authority of the Surgeon General's office we can do nothing whatever because there must be a definite plan of work, and the organization must be a definite one, and follow along a

very definite plan which has been worked out with very great detail by the Surgeon General's office. A base hospital has twenty-four medical officers, sixty-five trained nurses, two dental surgeons, and a staff of one hundred and fifty-six enlisted men all with very definite arrangements for administration and the detail of arrangement is a most extraordinary piece of work to be done. Undoubetdly the organization and equipment for an eye, ear, nose and throat hospital would require special organization and equipment. These are things which have never been done before in this country. Therefore, it does seem to me the time has come when a Committee from these various Societies should organize and send out at least two base hospitals. Therefore there are forty-eight highly trained efficient specialists to care for certain cases from the various base hospitals which the ordinary eye, ear, nose and throat man on the staff of this hospital is not able to properly care for. Of course, all the base hospitals are cleared from time to time of their cases which require more extensive operations and care and it is very necessary that the base hospital should have some further clearing house to take care of these most extraordinary and highly specialized cases. It therefore seems to me that we should take some definite action along that line and this service to our country to my mind is of the very highest scientific value and also the greatest demonstration of the patriotism which is within all of us, if we just have an opportunity to manifest it.

Dr. Joseph H. Bryan, Washington, D. C.: I would like to emphasize one fact. In case this Committee is appointed, and I hope it will be, the matter can be brought directly to the attention of the Surgeon General, and the fact emphasized that the men who are highly trained in the various specialties will be wasted if they are sent on the ordinary staffs, and the points made that there would be a very great waste of good material to be sent on duty of a kind that the younger men can be utilized for, and that we as highly trained specialists should be called upon to do the work as outlined by Dr. Shurly.

Dr. Charles W. Richardson, Washington, D. C.: In regard to the base hospitals, I have a list of the base hospitals already established in this country, that is, up to the period of the middle of April.

In most of these hospitals there will be a throat and ear service. I would like to make one remark and that is the disposition of the Surgeon General's office with regard to specialists.

I know that it is their desire and their intention to make use of the men in special service as far as it is possible and practicable. At the present time, of course, there is some confusion. The men question the advisability of the work that is being done by the Surgeon General's office in certain matters. There is no doubt, and they recognize the fact, that some few mistakes have been made and they are correcting those mistakes as fast as they can. I called attention not long ago to one mistake they made in a recruiting officer. They recognized it and said it would be rectified immediately, and I know it has been done. So, if we appoint this committee, which I hope will be done, I am sure the Surgeon General and assistants, both of the Army and Navy, will listen to that committee and will do all that committee wishes, that is, within reason.

One other point in regard to Dr. Mosher's remark about his inability to decide just what to do. Now, every man must consider this question from his own point of view. Every man knows what his duty is to himself, to his family and to his country, but there is one fact that stands paramount. The example of the class of men that represents this society to the younger medical men throughout the country is a great one and should not be lost sight of. If you can go about among the younger medical men and say, "I am already in the service," that young man is going to think, and he is more apt to offer himself to the service of his country if he knows that Dr. Goodale, or Dr. Halsted, or any other gentlemen of this society have already offered themselves freely to their government, to be used as the government sees fit. And I hope that the men of this society will offer themselves freely for the service of their country to be used as the Army authorities may see best and fit to make use of them.

Dr. D. Bryson Delavan, New York City: The history of medical enlistment with us at the present time is exactly that of Canada at the outbreak of the war. It explains the splendid sacrifice of Dr. Birkett. Following the leadership of the best men the young men came forward. Our own very best surgeons, Cushing, Gibson, Brewer, Crile, Murphy and others like them have come forward to do as Dr. Birkett did, in order to secure the following of the younger men. Dr. Shurly touched the keynote when he said that organization is needed.

It must be remembered in spite of what was said by Joseph H. Choate with regard to the necessity for haste, that we must not be in too great a hurry. There are certain responsibilities to be met in affairs at home. We will be in the same position as England if everything at home is sacrificed to the war interest.

Medical teaching must be kept up, medical students must be graduated, and our sick must be cared for. Meanwhile, those who stay at home must be prepared to loyally support the interests of those who go.

Dr. Max A. Goldstein, St. Louis, Mo.: I think this is really a time when we need education as well as the spirit of the actual thing itself. Without much circumlocution I would suggest that there be a propaganda of education to put us all in a position to study the question as carefully as we know how. This might be developed by the committee already urged. Personally, at the present time, I should like to place at your service for this organization and its committee, the *Laryngoscope* and its editor, for any publicity work you require whenever and as often as you require it, and to place at your disposal furthermore the mailing list of the office of the *Laryngoscope,* which includes the names of three thousand men of this country.

A motion was made by Dr. Thomas Hubbard that the Board of Directors and Council of the American Laryngological Association be given full power and instruction to act on behalf of the American Laryngological Association and in co-operation with like Committees from kindred societies, the American Otological Society, the American Ophthalmological Society, and the American Rhinological, Otological and Laryngological Society, to offer the services of each to the Government in their respective special capacity.

Dr. Thomas J. Harris believed that this motion should be made more specific and that the recommendations contained in the report of the Special Committee, as well as the recommendations of Dr. Shurly, should be incorporated in this motion in words to this effect, and amended the motion to read:

That it is the sentiment of the Association that the Council appoint a Committee to co-operate with like Committees of kindred Societies, who should formulate a petition to the Surgeon General as an expression of our feeling that we as specialists should be made use of in that capacity.

Dr. Harmon Smith believed that it was the experience of all, that where a large Committee has a matter in hand, it is not carried out as effectively as when the Committee is concentrated. The Committee consisting of Drs. Richardson,

Shurly and Mosher, acquainted with all the matters in connection with the Council of National Defense, he felt could also familiarize themselves with the matter, and since the original motion had not been seconded he felt another motion would be in order embodying this point.

Dr. Henry L. Swain emphasized the fact that the Association in Executive Session was superior to all Committees and he agreed with Dr. Smith that this Committee should be authorized without further delay to act in the matter so that the Association should place itself on record as standing ready to co-operate through the Committee with the Surgeon General's office both as an Association and as individuals, and that the Surgeon General may call upon the Association or upon its individuals to do whatever they saw fit.

Dr. Thomas J. Harris stated that although he had conferred with Dr. Hubbard he misunderstood the motion. He believed that what had been said by the other gentlemen was true and that there was going to be a saving of time by acting immediately, but he felt that the Council should have the power to fill vacancies.

Dr. Hubbard's motion was seconded, but lost.

Dr. Harmon Smith then moved that Drs. Richardson, Shurly and Mosher representing the American Laryngological Association, in conference with other bodies of like nature, should confer with the proper authorities and offer the services of the whole Association or of any of its individuals, and that in the event of any vacancies, such vacancies were to be filled by the Council.

In discussing the matter as to whether the Candidates Nominating Committee should be a standing Committee, self-perpetuating, or whether vacancies should be filled by the President, which was embodied in a motion of Dr. Sluder:

Dr. Joseph H. Bryan moved that this Committee should be a permanent Committee and that all vacancies that may occur may be filled by the President.

This motion was seconded and carried.

*CANDIDATE'S THESIS*

# PRESENT DAY ASPECTS OF LARYNGEAL TUBERCULOSIS

H. ARROWSMITH, M.D.

In his inaugural address as first president of the American Laryngological Association, at its first annual meeting in 1879, Louis Elsberg enumerated by title all the laryngological publications of the American profession from the earliest times to that date, in number 2169.

Up to 1861 or '62, when the newly discovered laryngoscope began to be used by the progressive and enthusiastic few, among whom he was a pioneer, four papers had appeared which apparently had to do with tuberculosis of the upper air passages. From 1860 to 1879 twenty-two articles were published on this subject, usually under the title of laryngeal or pharyngeal phthisis, or phthisical ulceration of various regions of the throat. At this same meeting Francke H. Bosworth presented a paper on "Phthisical Ulceration of the Fauces."

Since that historic date papers dealing with every possible phase of tubercular disease of the upper air tract have poured out in ever increasing volume until now an enumeration would involve more research than did Elsberg's compilation of the entire literature of American Laryngology.

I can offer nothing new or original but I would like to present very cursorily our present day conception of laryngeal tuberculosis, particularly from the aspect of treatment —and the possibilities of treatment.

The attitude toward tubercular laryngeal disease of the profession at large, I mean that of both general practitioners and most laryngologists, constitutes one of the greatest reproaches to which we have ever subjected ourselves in our history as medical men.

If our consumptive patients received a fraction of the attention that is given to those with typhoid fever or pneumonia by the internist, or to those with hay fever or ozena by the laryngologist, most of them could be saved.

Fresh air, overfeeding and then resignation to the will of providence is no more likely to succeed to-day than change of climate combined with cod liver oil and the hypophosphites —and the same resignation—was two or three decades ago.

This comment of course does not apply to those clinicians who have made the study of general tuberculosis a definite part of their life work, nor to a small number of laryngologists who have striven earnestly to acquire some definite knowledge of the throat complications and their management.

As far as I am able to learn in most of the sanatoria, the private ones at all events, routine laryngeal treatment or even inspection is not practiced as a rule; indeed most of the private institutions decline patients who have obvious laryngeal involvement and at best the attention given them is purely perfunctory as is also the case when the patient is treated at home by the family physician.

Getchell (Boston Med. & Surg. Journ., July 2, 1914) discusses the plan of management of laryngeal patients in different State sanatoria. In his personal experience at the Massachusetts State Sanatorium, he notes that the local condition usually goes hand in hand with the general. Though the symptoms are closely allied to those of syphilis, it should be remembered that the disease travels along the surface by contact in tuberculosis and local cleanliness thus becomes a more important part of the treatment. As to operative treatment, he reminds us that the local manifestations are only part of a general disease and that their eradication by no means controls the process; that only in rare instances (sic) does an operation aid and then only in skilled hands. In sanatorium work he maintains that the routine throat examination and treatment can be better done as a part of their general routine examinations, by the resident physicians who by constant practice learn to recognize the finer shades of advancing tuberculosis better than can the laryngologist with no special training in

this field. I have quoted Getchell thus fully because he has made several assertions of great importance which I wish to emphasize.

The mode of infection and the general pathology of laryngeal tuberculosis are those of tubercular processes as a whole. It is conceded to-day that primary laryngeal tuberculosis probably never occurs and that most individuals who exhibit tubercular manifestations in mature life have been infected in childhood or infancy, the infection remaining latent as a rule, until some adventitious stimulus spurs it into activity in any or all of its protean forms. On the other hand, the protracted presence of this latent focus may confer on its host a relative immunity to subsequent infections.

Park (N. Y. Med. Journ., Apr. 28, 1917) in a paper read before the New York Academy of Medicine on "Channels of Infection and Methods of Transmission of Tuberculosis," says: "Two types of tubercle bacilli cause disease in man, the human type and the bovine type. The percentage of those infected by the one or the other depends on the use of raw milk in childhood and the amount of human tuberculosis that people come in contact with." He concludes that droplet infection is the most important method of transmission, conceding at the same time the responsibility of inhaled dust and ingested water, as well as direct transmission. Weber showed that in fifteen minutes after inhaling dust, bacilli could be found on the mucous membrane of the lower part of the trachea, in the descending bronchi and in the lung adjacent to them.

These bacilli may cause a local infection of the lung or they may be transmitted to the bronchial lymph nodes. At any time the primary infection may be spread by the blood and cause secondary foci.

Tuberculosis of the larynx is the most common of all the grave diseases affecting that organ, far more so than cancer or syphilis. "Different statistics give a varying relative frequency of laryngeal involvement in patients with pulmonary tuberculosis, between 3 and 25%. Even in sanatoria where laryngeal cases are supposedly excluded, about 6% of

the patients are found to have laryngeal lesions (Laub). As the frequency with which the larynx is involved increases with the duration of the pulmonary disease, post mortem examinations show the larynx to be implicated in 48 to 52% of fatal cases. Clinically, while infrequent in the first stages of the disease, laryngeal lesions are encountered in 72% of third stage cases of pulmonary tuberculosis (Laub). (Quoted from Thomson's Diseases of the Nose & Throat.)

Fetterolf (Laryngoscope, Jan., 1916) tabulated the gross post mortem findings in 100 patients dying of pulmonary tuberculosis: 83% showed microscopic laryngeal involvement, 11% more than Laub's figures. He says that it is quite probable that the remaining 17% or most of them, would show distinct microscopic lesions, which while undoubtedly true is of no special clinical importance.

Topographically the epiglottis showed lesions in 59%, the ary-epiglottic folds in 58, the ventricular bands in 52, the vocal cords in 49, the arytenoid cartilages in 57 and the interarytenoid space in 51. His classification of the pathological appearances seems most practical. He describes: a—Infiltration, b—Infiltration with superficial ulceration, c—Infiltration with deep ulceration, d—Superficial ulceration, e—Deep ulceration, f—Tuberculomata.

An unusual type which belongs in the category of infiltration greatly exaggerated, is described by Theisen (J. A. M. A., Nov., 1903) with the title Hypertrophic Laryngeal Tuberculosis. He encountered one case and refers to a very few similar ones in the literature. His patient was also seen by Gleitsmann, a laryngologist of the widest experience, particularly as to tuberculosis and from his comments it was unique in his experience. Curiously enough my only observation of such a condition was made possible by the courtesy of Dr. Theisen, who last October referred to me a girl twenty-three years old who had been under his care during her stay in Albany last summer. She had had symptoms referable to the larynx for eighteen months, mainly hoarseness and difficulty in swallowing, without pain. Tubercle bacilli had been found in her sputum. Wassermann tests had been negative. She

was unusually well nourished; there was a small area of infiltration in her right apex which seemed to be entirely quiescent, there was no disturbance of temperature and she felt perfectly well except for the discomfort in her throat. There was an enormous symmetrical thickening of both arytenoids, ary-epiglottic folds and epiglottis, the latter being slightly eroded on its under surface. The vocal cords could not be seen and the laryngeal aperture was greatly diminished in size. The mucosa was intact, except as described, grayish-red in color and the whole surface was extremely resistant to palpation and not sensitive. I advised hospital treatment which she declined and I did not see her again for more than two months when she returned and asked to be admitted to my service. The obstruction to swallowing had become much greater and she had decided inspiratory dyspnea. No ulceration could be seen. I did a tracheotomy as a matter of expediency and deeply incised the infiltrated arytenoids on the chance of finding pus, but without result, nor had she had any constitutional symptoms which indicated its presence. On the fifth day after the tracheotomy she died suddenly and inexplicably. There was no autopsy.

Presumably under the head of infiltration Fetterolf includes also those cases of perichondritis with abscess formation and so on.

At St. Anthony's Hospital, Brooklyn, in an ever changing service of nearly 400 beds, where practically all the patients are in advanced second and third stage of pulmonary tuberculosis, I should say that at least 90% of those seen during the last two years, totalling over 3,000, showed gross evidences of laryngeal involvement. Their condition may be appreciated by the fact that 30% die within one month of admission and a large fraction of that 30% within ten days. My experience covering thirty years, leads me to believe that the above is characteristic of the type of patient and period of disease that is sent to us laryngologists by the general practitioner, for treatment.

Most laryngologists see very little early laryngeal tuberculosis Many of them, perhaps most of them decline to see

it—so by the time these unfortunates are sent to those of us who deal with this disease, their laryngeal lesions have become the preponderating factor in their trouble and then it is rather late to do for them what we might have been able to do at an earlier period.

In private practice I have had the opportunity to direct the general as well as the local treatment of a large number of consumptives from almost the inception of their sickness and I have never seen a frank laryngeal tuberculosis develop in a patient who came at an early period and systematically and persistently followed a course of cleansing and sedative applications to his laryngeal and tracheal mucous membrane. As Getchell well said, "It should be remembered that the disease travels along the surface by contact in tuberculosis and local cleanliness thus becomes a more important part of the treatment," for prophylaxis the *most* important part of the treatment.

From this experience I am convinced that the laryngeal lesions originate almost invariably from surface contamination —very rarely by way of the blood and lymph streams. The occurrence of infiltrations without discernible erosions of the mucosa is no argument against this mode of infection for it is well known that the bacilli have the power to penetrate intact mucous membranes.

Unfortunately the old belief in the incurability of laryngeal tuberculosis still persists in the minds of many practitioners. This pessimism has been justified to a certain extent because local treatment commenced at the usual late period cannot overcome the results of delay or be brilliantly successful, but modern methods even in late stages enable us to do a great deal to palliate the patient's sufferings even if the thought of cure cannot be entertained.

The matter of local prophylactic treatment has been spoken of. Intra-laryngeal and intra-tracheal injections as most enthusiastically employed by the late Dr. Gleitsmann and by Thompson of Cincinnati, are invaluable, for by them not only the larynx and trachea but also a considerable portion of the bronchial tree can be very satisfactorily medicated. Yankauer

by devising his medicator for the patient's use has provided a means of making these injections almost as effectively as they can be administrated by an expert laryngologist. The medicaments should be used in a bland vegetable oil vehicle. Hydro-carbon oils have no place in the therapy of the air passages; the active constituents may be whatever is appropriate to the condition we wish to relieve.

Lockard is enthusiastic in his recommendation of local applications of formalin in solutions of different strengths from one-half to ten per cent., but less irritating agents have seemed to me equally effective and more manageable.

It is perhaps superfluous to refer to the necessity for removing all obstructions to normal nasal respiration. Freudenthal warns against the removal of the tonsils in subjects of well marked pulmonary disease, which he fears may be followed by serious pulmonary hemorrhage. I have done it repeatedly without any such experience and with benefit to the patient. In an adult tonsilectomized by Dr. George Richards in my service at St. Peter's Hospital, we found what has been rare in my experience, true histological tubercle of the tonsil. This patient convalesced as promptly as usual.

As to the drug therapy of actual and extensive laryngeal tuberculosis, palliation is all we can hope for Hastings and Bonime of New York are doing work in tuberculin therapy which promises much for the future.

For the relief of pain from tubercular ulcerations the local anesthetics—orthoform, propaesin, anesthesin, etc., have great value especially in the form of emulsions so extensively used by Freudenthal. Quinine and urea hydrochloride has recently been lauded for this purpose as well as for blocking the superior laryngeal nerve according to the method of Hoffmann, alcohol for this purpose seems preferable. Scarlet red has been extolled for its effect on tubercular ulcerations.

After the outburst of enthusiasm caused by the work of Heryng and Krause and Moritz Schmidt in the surgery of the tubercular larynx, a reaction set in and laryngologists, with a few notable exceptions, abandoned most kinds of surgical attack. In America Gleitsmann, Lockard and a few

others continued to work along these lines conservatively and scored many triumphs.

External surgery has not been successful except that thyrotomy and tracheotomy may occasionally be permissible as emergency measures. With the old methods there were many reasons for failure except in the hands of the most expert operators. While fundamentally sound in its conception the old endo-laryngeal surgery did not appeal to most men because of the difficulty of uni-manual attack, the inadequacy of indirect illumination by reflected light, the instability of the operative field by reason of the weakness and hyperesthesia of most of the patients suffering agonies which cocaine did not control.

With the advent of the direct laryngoscope and particularly the suspension laryngoscope there has been presented to us in laryngeal surgery an opportunity quite equal to that of the general surgeon or the orthopedist. Our field is now as accessible as the external surface of the body and we can do quietly and leisurely whatever we have planned, under good illumination, in an immobile territory and with the free use of both hands.

We owe a great deal to Lockard for having so consistently insisted on epiglottidectomy as the rational treatment for epiglottidean tuberculosis. The fact that the epiglottis could be spared without trouble was first noted by Enos of Brooklyn (Trans. Kings Co. Med. Soc., Vol. 1), who in 1865 reported that on autopsying a patient dying from consumption he found that the epiglottis had been completely destroyed by ulceration. He stated as a very remarkable fact that during her lifetime she had no difficulty in swallowing. Porter (Am. Journ. Med. Sc., April, 1879), was apparently the first operator in this country to deliberately remove the epiglottis which he did for malignancy. Emil Mayer has substantiated his claim of having done the first complete removal of the epiglottis under suspension, also for malignancy and I venture a claim for the first epiglottidectomy under suspension laryngoscopy for tuberculosis. Both these operations were done within a week of each other and I had no knowledge of Mayer's exploit.

Amputation of the epiglottis under these conditions is in striking contrast to the old indirect way of extirpating it by punch forceps. I make an incision on each side as far down as possible, then seizing the free border with forceps, the snare is pushed well down and the wire naturally follows the lines of incision when upward traction is made by the forceps; the entire epiglottis is removed down to its ligamentous attachment. In scores of epiglottidectomies I have seen very little reaction, but *once* any considerable bleeding and almost universally immediate relief of dysphagia and odynophagia—in the absence of ulcerative conditions in other locations.

In superficial ulcerations the galvano-cautery accurately used, as is possible only under direct exposure, leaves nothing to be desired.

I cannot imagine how any one after a single experience would ever revert to chemical caustics.

Deep ulceration wherever situated can be unerringly reached, thoroughly curetted and cauterized. Deep puncture with a fine cautery point has a most happy effect on infiltrated areas and is the ideal way of attacking abscesses occurring with perichondritis. Tuberculomata and infiltrated masses may be cleanly excised in an orderly surgical way. I have been surprised at the very slight degree of reaction which follows these procedures; it seems less than we would expect in normal tissues and I have never encountered the post operative upsets reported by some observers.

Slight or moderately extensive lesions can surely be *cured* by well considered surgical treatment with the aid of suspension exposure; the severer ones can be much ameliorated and the consumptive helped at least to die, without the intolerable suffering which so often accompanies tuberculosis of the larynx.

Suspension laryngoscopy has its greatest opportunity in this particular field. Its technique should be acquired by every one who assumes to treat diseases of the larynx.

*(Candidate's Thesis)*

# SUSPENSION LARYNGOSCOPY—AN AID IN REMOVING FOREIGN BODIES FROM THE LARYNX AND UPPER ESOPHAGUS—REPORT OF CASES

WM. B. CHAMBERLIN, M.D.

This history of laryngology has been punctuated by certain outstanding events which have ushered in epochs of great advancement. The first of these was the invention of the laryngoscope by Garcia in 1855. From this humble discovery, simple in the eyes of the practitioner, and even of the medical student of to-day, laryngology had its origin. The beginning of the next great epoch of advancement may be said to date from the introduction of cocaine in 1884. Subsequent to this, although progress was steady and continuous, no really great event in its development occurred until the introduction of the bronchoscope by Kirstein in 1895 and its subsequent perfection by Killian, Jackson and others.

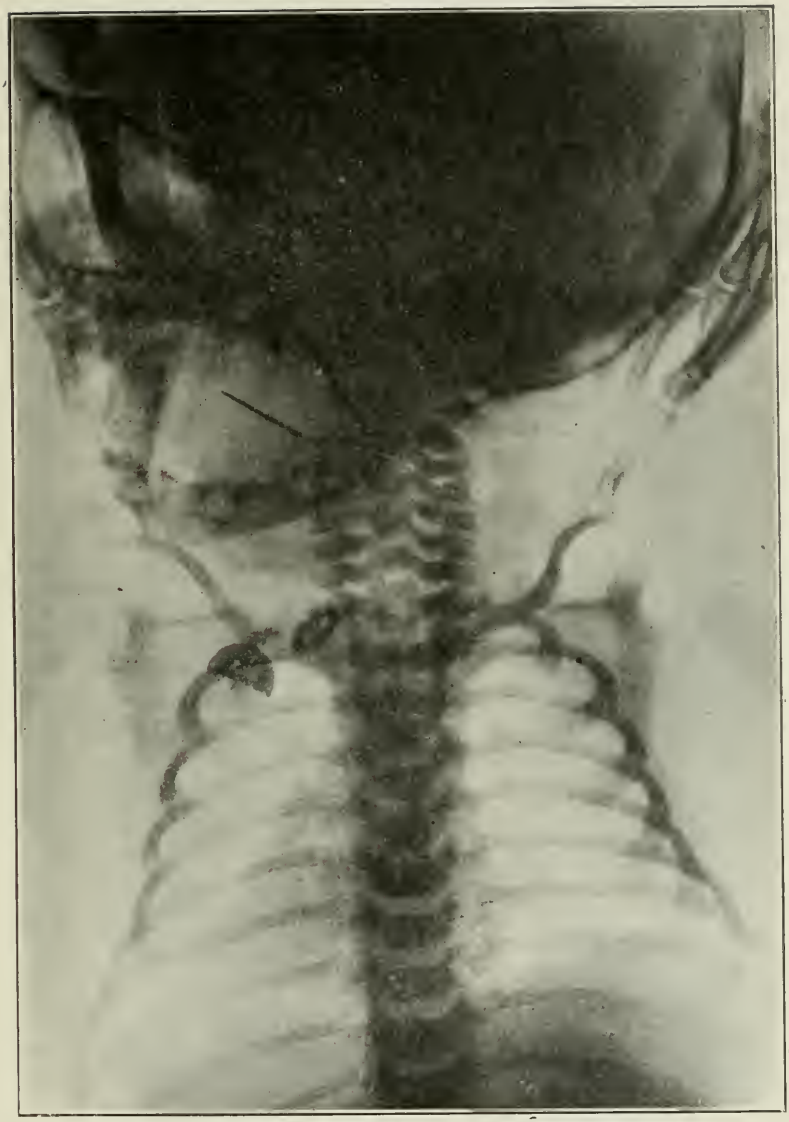
But whereas the invention of the bronchoscope may be looked upon as epoch making, in the ultimate possibilities which it has brought within its field, no such position can be accorded to suspension laryngoscopy; however enthusiastic we may be in regard to its use. Granted that, with suspension, we can view a field *in toto,* of which we can gain only a composite picture with the bronchoscope, still the possibility of the same view with the bronchoscope nevertheless exists, while the ultimate extent of the field opened to us by means of bronchoscopy or esophagoscopy is immeasurably greater than anything which suspension may afford. So we may say that suspension is in reality a refinement of bronchoscopy, giving us an immediate and more comprehensive view of a much more limited field, making possible certain manipulations within that field hardly possible by means of the tube, and rendering certain other manipulations vastly more easy.

It is to the latter of these advantages that I wish to call your attention—namely the removal of foreign bodies from the upper respiratory and alimentary tracts.

One equally familiar with tube and suspension work can scarcely fail to have noted certain advantages possessed by suspension in the rather limited field to which it can be applied. First of all may be mentioned the extent of the field immediately before our eyes, an extent in breath and thickness, even though the length may be limited. Certainly the tube can give us nothing similar. In addition we are not only able to examine every portion of this field most readily ourselves, but we can demonstrate it almost equally well to others. And last of all must be mentioned the advantage which comes from the free and untrammeled use of both our hands. Whereas in tube work the left hand is continuously employed in holding and directing the tube, in suspension both hands are equally free and available for use. This has rendered possible certain operations *per vias naturales* hitherto only possible by the external route. I have only to call your attention to the very wonderful technique developed by Lynch, a member of this society, as an illustration.

In foreign body work the advantage of this ability to use both hands is frequently most apparent. I refer especially to the difficulties in disengaging pointed objects partially imbedded in the walls of the surrounding tissues—notably open safety pins. A foreign body lying in the larynx or upper part of the esophagus, especially if it be pointed and partially imbedded, often presents peculiar and unusual difficulties. In such cases, if the tube be employed, only the point of the tube is engaged and its position is maintained and controlled often with much greater difficulty than when the foreign body lies deeper within the trachea or esophagus. The strain placed upon the left hand is considerable. With suspension the spatula, after once adjusted, remains firmly fixed in position. This position may be altered at will by means of the screw adjustments, while both hands are left equally free for the performance of the operation in question.

My first two cases were in infants nine (9) months and



Open safety pin—esophagus. Child 2 weeks old.

two (2) weeks old respectively. In each the size, shape and position of the pin had been carefully determined by previous X-rays and in each the technique used was the same. On bringing the head of the pin into view under suspension, this was grasped by one forcep and moved laterally, with slight traction, in a direction toward the point. This manipulation tended to disengage the point from the position where it was imbedded and bring the shaft into view. Now with the head held firmly by one forcep in its new position, the shaft was grasped by a second forcep in the free hand and traction made in the direction of the mouth, thus further disengaging the point and bringing the eye, or curled portion of the pin, into view. In other words a complete version was performed, as of the *foetus in utero*. The removal was then the work of but a few seconds—the whole operation, after the suspension apparatus had been placed in position, requiring almost less time than its description.

The last of my three (3) cases was in an infant eleven (11) months old and was for some unknown reason more difficult, probably the deeper position of the point in the tissue, and required a much longer time. In the latter case version was repeatedly tried, as in the two previous cases, but was unsuccessful; a considerable amount of time thus being lost. A short tube was then inserted through the opening afforded by the suspension, the point of the pin disengaged from the tissue by means of forceps and drawn well within the tube. Tube and forceps, including the pin firmly in its grasp, were then easily withdrawn.

Suspension is not only especially applicable to the removal of foreign bodies from the upper oesophagus, but from the larynx as well. Sylvia P. aged 4 years, had exhibited stertorous breathing, slight dyspnoea and some cough for two weeks. The usual methods of examination, as well as X-ray, gave no results. Examination under suspension showed a thin foreign body lying antero-posteriorly, parallel to the cords and firmly imbedded in the anterior commissure, as well as in the inter-arytenoid space. This was grapsed by forceps and removed with considerable difficulty. There

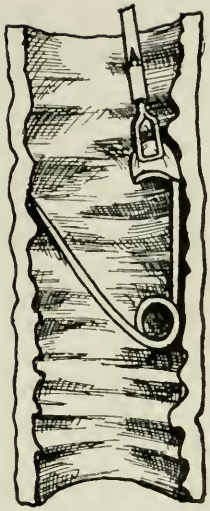



*Fig. A*

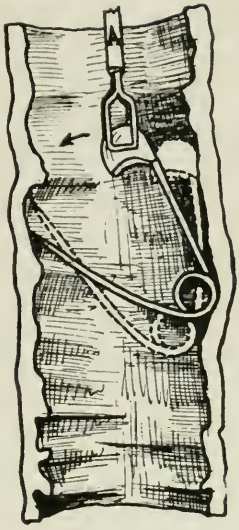



*Fig. B*

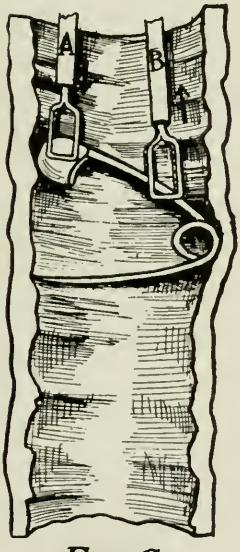



*Fig. C*

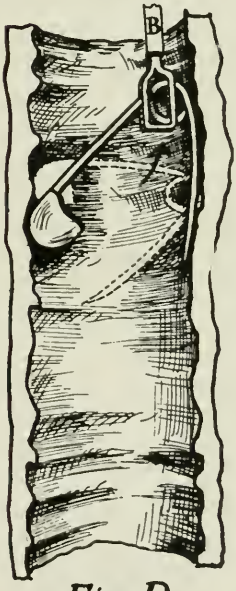



*Fig. D*

Showing method of turning safety pin in esophagus under suspension.

was slight bleeding and some laceration of the tissues. The child made a rapid and uneventful recovery, leaving the hospital on the following day. The object, probably a thin piece of bone was roughly triangular in form and about 2 m.m. thick. It measured 8 x 15 m.m.

The last case I have to report is that of a workman, who, while eating a piece of bread and butter with jelly, felt a sharp foreign body on the base of his tongue, and later in his throat in the region of the larynx, after the bolus of food had been swallowed. X-ray examination showed a slight shadow in the region of the upper part of the larynx. Examination with the mirror showed a thin spicule of glass extending transversely across the middle of the right cord, its opposite end evidently imbedded in the false cord or ventricle. Removal might have been attempted and accomplished by the indirect method. But with the indirect method the patient must be in the erect posture, where the spicule, if disengaged and not firmly grasped by the forceps, might easily drop downwards into the larynx and trachea. With the patient in the horizontal position, this danger would be avoided. By means of suspension and under local anaesthesia the spicule was easily grasped by the forceps but, in my anxiety lest a too firm bite would crush it or break off the point in the tissues, the disengagement tore it from the forceps and it was lost. Prolonged and careful search failed to discover it. The patient was returned to the ward in good condition, and, as he manifested no untoward symptoms, was discharged from the hospital two (2) days later. On the third day following the spicule of glass was recovered from the stool and measured 17 x 3 x 2 m.m.

Suspension may be performed either under general or local anesthesia. In the last case reported there was little accompanying or subsequent discomfort, though the operation lasted something over an hour. Manifestly an examination under local anesthesia could hardly be made in a highly nervous on hysterical patient. Neither could it be made in infants or children. With the latter a general anaesthetic is required. To many this would constitute a very decided disadvantage. Jackson insists that in tube work with children no anaesthetic

whatsoever be employed. With this dictum I cannot agree, though I am perfectly willing to admit the success of the method in Jackson's hands. The only fatalities I have had in foreign body work, were in my earlier cases in children where no anaesthetic was used. I firmly believe that in the hands of nine-tenths of the men attempting, or pretending, to do foreign body work, the attending risk to the child with an anaesthetic is very much less than *without*, Jackson's results notwithstanding. The latter has developed a technique, to my mind possessed by few or possibly no other man, so that without anaesthesia and working through an extremely long and narrow tube, the vast majority of his operations require but a minimum of time. With others the time consumed is much greater, while accompanying this are increased shock and danger of lacerating surrounding tissues and structures. After the child is first anaesthetized and the suspension, or tube, placed in position one is struck with the slight amount of anaesthetic required. The condition is in reality one of analgesia, not anaesthesia. So I reaffirm that the question of anaesthesia is one which every operator must settle for himself, and on the merits of the particular case in question.

From a rather limited experience my conclusions are as follows: First, that foreign bodies lying in the larynx, hypopharynx or extreme upper part of the esophagus often present decided difficulties with the tube. Second, that this is in most cases due to the difficulty of maintaining the tube in position, only its tip in reality being engaged. Third, in such cases suspension may afford an ideal solution of the difficulty, since (a) it remains firmly in position after it has once been adjusted, and (b) the free use of both hands is made possible. Fourth, with either tube or suspension a general anesthetic is indicated in children, though either may be used with local anaesthesia in adults.

(*Candidate's Thesis*)

# NASAL AND NASO-PHARYNGEAL FIBROMA, WITH A REFERENCE TO MULTIPLICITY OF GROWTHS

GEORGE MORRISON COATES, M.D.

It was not the intention of the writer, in undertaking this thesis to review the whole subject of fibromata of the upper air passages since most exhaustive treatises have appeared, many of them in the Transactions of this Society, during recent years. Such treatises have given extensive bibliographies and discussions on the etiology of these peculiar neoplasms, the different modes of combating them and on their well-known tendency to recur, and, now, equally well known tendency to disappear at a certain period in the development of the afflicted individual. In the review of a recent case of my own, incorporated herein, the writer was forced to the conclusion that he was dealing with a definite multiple growth, evidently a rare condition, and hoped by a review of the literature to substantiate his position. Such a search, however, failed utterly to bring to light a single report where more than one neoplasm that could be indubitably classified as a true fibroma had been found at one time in a case, so that a discussion of the duality or multiplicity of growth from this standpoint is barred and can only be taken up on the ground of the case presented. During this search the literature of the subject was reviewed during the last few years without the discovery of very much that was new or at variance with opinion quoted a short time back in the essays referred to above. For the most part these monographs consisted in case reports and continuations of the older discussion as to etiology, the advantage of the external route, the trans-maxillary route or the natural passages as the approach for operative removal, and the arguments pro and con in regard to electrolysis, injection, evulsion, etc. There will be briefly summarized later.

The case that drew the attention of the writer recently to this subject appeared to him to be a case where there coexisted in the same patient a nasal and a naso-pharyngeal fibroma as distinct and separate entities. There is a doubt expressed in many papers as to the similar nature of fibromata when found in these different locations, and some authors even go so far as to say that nasal growths are really but nasal prolongations of the naso-pharyngeal tumor and vice versa. It is taken for granted, here, that it is an accepted fact that true fibromata dura may be found with their insertions in either cavity, thus constituting a true nasal, or a true rhino-pharyngeal fibroma as the case may be, exclusive of the often noted fact that prolongations of the original tumor may and frequently do, invade neighboring cavities and form more or less dense adhesions there, sometimes simulating true attachments. In fact, one case is on record by a most competent observer, Richardson[1], where there were two distinct pedicles in a case of the naso-pharyngeal type operated upon by him.

As before stated, there are few allusions even to the possibility of there being more than one growth in a given case. Ballenger[2], indeed, says such tumors are "usually" single and Pierce[3] makes the statement that they are "never" multiple although they frequently form secondary attachments by pressure erosion and adhesion. Wells[4] uses the term "fibrous polyp" for the more characteristic one of fibroma and says these tumors "occur as a rule, singly" and that they seldom recur. This latter statement hardly agrees with the generally accepted view, where the tendency to recurrence is one of the three cardinal causes of failure to cure by operation, the others being hemorrhage and death during operation. He also notes a tendency to "infiltrate" surrounding bone cavities. It is well known that absorption by pressure of neighboring bony structures is often caused, as well as invasion of cavities through the natural ostia, but infiltration of the bone is a characteristic of true malignancy. The above mentioned writer reports three cases removed without difficulty with the cold wire snare. Two of these cases were in girls, which lays

them open to the suspicion of not being true fibromata, and in one of these the pathological diagnosis was a "fibrous polyp," while in the other it is not given. Moreover, in the last case (the one diagnosed a "fibrous polyp") four large masses were removed. This is the only case which has been found in which more than one growth was present and in this there seems to be a reasonable doubt whether these four masses were traced to separate and distinct pedicles and, if so, whether they were not in reality mucous polypi presenting much fibrous tissue.

I wish, here, to protest against the continued use of the term "fibrous polyp" as applied to fibromata. It is not histologically correct, since these tumors have no etiological, clinical or histological relation to mucous polypi, which by common consent are now understood to be meant when the term polyp is used; their only point of resemblance being the pedunculated form that they sometimes assume. In searching the literature, one is constantly misled by the use of this term, when a study of the article shows finally that a fibroma was meant or not meant as the case may be. Since there is such a pathological condition as a true mucous polyp showing fibrous change the term should be confined to descriptions of these and much confusion would be thereby avoided. These are by no means uncommon but their course and treatment are entirely different and relatively simple.

Stucky[5] has never seen a case exhibiting a multiple growth, although many are lobulated, nor has he seen any fibroma which any cold snare would cut through; while Lincoln[6] reporting a case of naso-pharyngeal fibroma removed by external preliminary operation, remarks that such growths are comparatively rare "arising in the nasal chambers and unaccompanied by similar growths in the naso-pharynx," thus by inference suggesting that they do at times occur in combination. So much, or rather so little have I been able to find concerning multiple growths.

There are some points of interest in regard to the etiology and, in particular, to the point of insertion of these growths, in reference to a distinction between the nasal and naso-phar-

yngeal type of these neoplasms; many observers holding the view that they are two distinct types of growth. Thus Getchell[7] states his belief that naso-pharyngeal fibromata should be classified as being distinctly different from naso-fibromata. He bases this belief on the well known facts that naso-pharyngeal fibromata almost invariably occur in young males near the age of puberty and have a marked tendency toward recession at about the age of twenty-five if the patient does not succumb before that age is reached. Naso-fibromata, on the other hand, are found in either sex and more often in those past middle life. Wright[8] states the commonly accepted fact that naso-pharyngeal fibromata have their origin in the dense fibrous tissue and periostium on the under surface of the basilar process of the occipital bone and the body of the sphenoid; and Getchell believes that many growths now classed as nasal should be put in the former class, although their origin is from the face of the sphenoid or the spheno-ethmoidal recess. One of the two cases reported by him had such an origin. Casselberry[9] draws a marked line of distinction between these two types. Most of the cases reported by him occurred after the age of twenty-five in contradistinction to the early age at which naso-pharyngeal fibromata appear and disappear. Chamberlin[10] calls attention to the above mentioned distinction and to true "fibrous polypi" (not fibromata), and quotes Zarnico showing that they are two distinct entities. He reports four cases operated upon, three successfully and one with recurrence, but suggests that only two, being sessile tumors, came within Zarnico's classification as true naso-pharyngeal fibromata. From the descriptions given, however, it would seem that the two pedunculated tumors were of nasal origin, since the histological diagnosis was true fibroma in each case. Four cases in the hands of one man in a comparatively short space of time is a larger number than happens to most laryngologists.

Many observers believe that the true nasal fibroma is a rare growth. Casselberry, quoted above, reports a case of nasal fibroma in 1898, successfully operated upon by him, and comments upon the generally considered rarity of the con-

dition, although he adds two authenticated cases collected from the recent literature of that time, and many more have been added since. While for many years the effort was constantly put forth to prove that all these fibrous growths had the classical origin assigned to them, namely the base of the sphenoid, the basilar process of the occipital and perhaps the two upper cervical vertebræ and that nasal growths were but extensions from these, in recent years there is a marked tendency to take the opposite view and give all fibromata a nasal origin with the naso-pharyngeal masses as being merely secondary. Thus Herbert Tilly[11] thinks that most of these growths are "post-nasal" in that they spring from the spheno-ethmoidal recess rather than from the vault of the pharynx; and while Moore's[12] case had a very broad naso-pharyngeal attachment, yet when this was liberated, the growth apparently had its insertion where Tilly believes they always arise. Uehermann[13] has removed a number of these tumors by the trans-maxillary route. He belives that in operating in this way, he has discovered that the insertion is usually, if not always, from the *face* of the sphenoid and the spheno-ethmoidal recess, the tumor spreading thence into the nasal chambers, accessory sinuses or into the naso-pharynx and that all other attachments are secondary and due to adhesions. This is certainly contrary to the generally accepted idea that those growths classified as naso-pharyngeal spring from the occipital bone and the upper cervical vertebræ although he is supported in this view by D. Jacques.[14] This author says that until recently opinion was almost unanimous that the origin was always from the basilar process of the occipital bone and the two upper cervical vertebræ, and that all other points of attachment were adventitious; that the tumors only secondarily invaded the cavities of the face. Jacques argues from the history of many of these cases that as one choana is usually obstructed before the other, the growth must have its origin in one nasal chamber, and supports this view by reports of eight cases studied and operated upon by him, in each one of which he found the true attachment in the spheno-ethmoidal recess or on the *face* of the

sphenoid. In corroboration of this view he quotes, Texier, Raoult, Moure, Latour, Gautier, Duverger, Beca, Lafitte-Dupont, Castex, Escat, Sieur and Gaudin. He seems to believe that all fibrous tumors spring from the nasal passages and that the attachment to the occipital bone and cervical vetebræ so commonly found are merely adhesions. Such adhesions can be easily separated while the true insertion invariably is to the bone and bony spiculae are removed with tearing away of the growth. Jaeques and Escat also note the predilection of these tumors for the left side, a fact I have not seen noted elsewhere.

It seems to me more rational to believe that these tumors may have their origin either in the nose or naso-pharynx and that they are identical except in the location of their point of insertion, and this in spite of the apparent differences of age and sex in which they occur. Certainly a tumor of the naso-pharynx, with prolongation into the nasal chambers, as reported by Ballenger[2] and many others must not be classed as a naso-fibroma or, vice versa, one arising from a nasal insertion with a naso-pharyngeal extension, adherent or otherwise. As a matter of fact, many of these so-called *nasal-fibromas* are not true "hard" fibromata at all, but polypi showing a large amount of fibrous tissue, *fibrous polyps* as they are often, and truly called. These have their origin in sinus disease and are misleading unless a careful microscopical study is made. Several times I have thought that I had cases of fibroma dura until undeceived by the microscope, and the literature abounds with reports of such cases.

There is a very definite belief that neoplasms of the naso-pharyngeal type show a marked tendency to atrophy and disappear after the patient reaches early adult life, if indeed he can succeed in living that long. Cases reported by Ingals [15] and Swain [16] of vascular sloughing fibromata bear this out. In their cases numerous terrific hemorrhages took place after spontaneous sloughing of parts of the tumor, and after each one the tumor decreased temporarily in size, only to take on renewed activity and growth until, for some reason, the limit was reached with the eventual disappearance of the neoplasm

forever. But, of course, in these cases much irreparable damage was done although the mere fact that life is saved may always be considered a satisfactory result. In Ingals' case where there was present a large nasal extension of the tumor of the vault, operation failed to prevent recurrence, but there was spontaneous absorption in a few years. Great damage had in the meanwhile been done, however, including the loss of sight in one eye, which emphasizes the fact that one cannot afford to allow these patients to go untreated for more than a short time in the hope of a spontaneous cure. That atrophy does not always take place at or about the twenty-fifth year, and yet may do so later is illustrated by a case of Pierce's, of naso-pharyngeal tumor in a male of thirty-one years which disappeared under observation by spontaneous involution. A number of similar cases are cited by this author, and Gibb[17] makes the same assertion so that there are many in accord in the belief that spontaneous disappearance should not be waited for in other than exceptional cases as the risk of damage or ultimate failure to atrophy is too great. Holmes[18], on the other hand, writing in 1902 had observed spontaneous reabsorption in two cases at the early age of twenty-one, after operation had been unsuccessful in preventing recurrence due to inability to entirely eradicate the mass. It is with the hope of such a spontaneous cure in mind that the injection treatment advocated by Harmon Smith[19] and others probably has its greatest value. Smith has had signal success in coping with this condition by injections of monochloracetic acid, and lactic acid has also been used successfully. He reports two recent cases thus treated with decided reduction in size of the tumors. Other operators have reported similar results although the method does not have very general support due to the fear of hemorrhage from the sloughing masses. Where a tumor is causing much distress and it is desired to carry the patient a short time hoping for a spontaneous cure much may be accomplished in this way.

The probability of recurrence is universally recognized and the main object of a complete removal is to minimize this danger. McBride[20] states the general opinion of the profession

that the greatest probability of recurrence is when a stump is left and many efforts have been made to eradicate this stump by caustics, electrolysis, radium, etc., all more or less successful at times. Reports of recurrences are numerous in the literature, as reviewed above by Holmes, due to inability to entirely eradicate the base. Kelson[21] comments on a case of his own where recurrence took place two and one-half years later and Horne in discussing this paper says that the mother part of the tumor must be gotten away, for such tumors at times kill by metastasis. While this latter statement is undoubtedly true of fibrosarcomata, a closely allied neoplasm, it is not generally accepted as applying to true fibromata. That such recurrences may be long delayed is emphasized by Lambert Lack[22] whose case went without recurrence for twelve years only to show renewed growth after that time.

The chief obstacle to a complete eradication of the insertion is profuse hemorrhage at the time of operation and this varies very much in different cases, due probably more to an increased vascularity in certain growths than to the mode of removal, although this is a very important factor. Many share the belief of the writer that if the growth can be torn away at its very insertion, which is not always possible, the hemorrhage will be less than if the stump is left, making it impossible for the blood vessels to retract. Richardson and Gibb, quoted above, are in accord with this view and Stucky finds that the growth can be loosened, during avulsion, by rocking as a dentist does a tooth before final detachment. Both Gibb and Richardson are on record as believing that if the growth is removed completely and with its attachment, there is little danger of extensive bleeding. Although doubtless this is true in many cases, yet there must be many where the bleeding is profuse in spite of thorough removal, and thorough and quick removal is not always, or even often, easy of accomplishment in large tumors with extensive attachments, either primary or secondary, and with numerous prolongations.

Delavan[23] has again called attention to his position taken

in earlier papers[24 & 25] that the old method of removal, practiced by the general surgeon, by extensive preliminary operation is unjustifiable in view of the results obtained by Voltolini and Lincoln[26] by the use of electrolysis and the galvano-caustic snare, and by Doyen with his operation for removal by the natural passages. The technic of these operations has reduced the previous high mortality to almost nil, and these are the procedures now in almost universal use in the American and French schools. A review of British literature of recent years, however, shows that the tendency there is still to consider the formidable external operation, preceded by tracheotomy. If removal is attempted per via naturales and without the aid of electrolysis, avulsion in some form or the use of the cold wire snare where possible, seems to be the procedure of choice in this country.

A case history is appended which illustrates some of the points discussed in the preceding brief review. It seems to the writer to be unique if his belief is correct that there were coexistent nasal and naso-pharyngeal growths present. The other features of the case are commonplace, although every case reported helps to swell the record of what is, after all, not a common condition. A period of four months is too short a time to infer much in the way of immunity to recurrence but it is at least something gained.

*History of Case.*

This case that came under my observation recently seemed to me to present sufficient interest to warrant a brief report and comment on fibromata of the upper air passages.

Jacob Weiner, age 15 years, presented himself at the Out-Patient Department of the Pennsylvania Hospital on December 8th, 1916, complaining chiefly of nasal obstruction. He was somewhat under-developed, although not flat chested, had a moderate degree of anemia, and a sallow, unhealthy complexion. Mentally he was well developed for his age and condition though presenting evidences of aprosexia. Nasal breathing was almost entirely absent, a very small amount of air being forced through the left nostril on forcible expira-

tion. The nose was prominent and broad at the base and toward the bridge; the mouth open, jaw relaxed, chin somewhat under-developed.

According to the history given he had had none of the diseases of childhood except measles. He had been healthy and not a mouth breather until about five years previously, when, at about the age of ten, he began to suffer from nasal obstruction, most marked on the right side. This was diagnosed as due to an adenoid growth but operation was refused. Nasal obstruction progressed and in the course of a couple of years became almost complete. He had no epitaxis, the ears were practically normal, had no headaches in particular, but had a great deal of nasal discharge, which he was unable to rid himself of by blowing because of the obstruction.

Nasal examination showed the septum markedly deviated to the left posteriorly, crowding against the left turbinals and including the inferior and middle meati. The right inferior turbinal was enormously hypertrophied anteriorly and the right middle very considerably so. A view of the posterior portion of the right nostril could not be obtained. By posterior rhinocopy, the naso-pharynx was seen to be filled with a hard, grayish-red mass that had the characteristic appearance of a fibroma and this diagnosis was made. The tonsils were small and the walls of the pharynx dry and covered with thick, tenacious, yellowish muco-pus.

On December 15th, a partial resection of the large right inferior turbinate was done after failure of refraction to give an adequate view of the posterior part of the nasal chamber. A large low spur was now discovered projecting from the right posterior portion of the septum. A good view of the posterior portion of the right naris being now obtained, the choana was seen to be filled by a fibrous mass, apparently having its origin in the spheno-ethmoidal recess and extending backward through the choana. This I believe to be either a nasal extension from the pharyngeal growth with adhesions in the nose, or a nasal fibroma extending into the pharynx with adhesions there, for this latter portion seemed to be

attached to the bodies of the upper cervical vertebræ. Manipulation through the nose with a probe, however, indicated that the upper or nasal growth, or portion of the growth, was distinctly pedunculated. Exact determination of points of attachment was impossible on account of the size of the mass and its closeness to adjacent structures, the septum being markedly deflected to the left by its presence. Following the turbinectomy several weeks were allowed to elapse to get rid of the bleeding and scab formation, which was very annoying, to study the tumor and to attempt to check the suppuration and inflammation in the nasal chambers and naso-pharynx in order to have a cleaner field for further operative procedures. On February 1st, an attempt was made to snare the nasal growth through the nose, a light, cold wire tonsil snare being used but without any success as the wires either broke or pulled out of the eyelets. The growth was, however, easily encircled and appeared to be distinct from the pharyngeal mass. These attempts were made under local anaesthesia. A week later, on Febuary 8th, the patient was placed in the ward and on the 9th a further attempt to remove the fibroma was made under warm ether vapor narcosis. A large, powerful Lewis tonsil snare carrying the heaviest piano wire (Nos. 9 and 10) that could be threaded into it was passed through the nose as in the previous attempt. The loop was carried into the pharynx and directed around the sessile pharyngeal growth with the finger in the mouth. Even these heavy wires, twisted and tied into the eyelets, simply pulled out straight without leaving so much as a mark on the tumor. The same thing occurred when the growth was attacked through the mouth with the aid of a palate retractor, and also when the pedunculated nasal tumor was encircled. Altogether six wire loops were spoiled, when success by this method was despaired of. With all preparations made to stop hemorrhage and to perform a tracheotomy, the pharyngeal growth, which appeared to be attached to the bodies of the cervical vertebræ upward to the basilar process of the occipital bone and extending from side to side of the pharynx and to the lower border of the velum palati, was seized with a

very heavy, powerful modification of Löwenberg's adenoid forceps, and, both hands locking the handles, with a rocking, wrenching, twisting motion and using a great deal of side force, the growth was detached after about five minutes continuous work. Scarcely any bleeding followed. The growth measured 3 x 4½ x 2 cm., and was complete and covered uninterruptedly with mucous membrane except on its large flat posterior surface where its attachment was. This raw surface showed fibrous bands and fragments of periosteum where it had been avulsed from the vertebræ and the occipital, and the finger in the naso-pharynx easily felt denuded bone in several places. The operation was now considered finished, as it was thought that the whole tumor mass had been delivered at once, but the little finger of the left hand forced through the right nostril and meeting the forefinger of the right hand through the mouth at the right posterior naris detected a pedunculated tumor still partially occluding this orifice. Again an attempt to snare this failed and again the forceps were used through the mouth being now guided by the finger in the nostril. The growth was seized and avulsed as in the previous procedure when to my surprise a mass almost identical in size and shape to the one first removed, was delivered, the only difference being that this second growth had a small pedunculated area of attachment. No portion of either growth showed any place where it could have been attached to the other, so that I was forced to conclude that I had been dealing with two distinct and separate tumors. The right nostril was now entirely patulous, and the finger in the naso-pharynx found a large cavity to the right of the median line in the spheno-maxillary fossa, the limits of which could not be reached, and which was apparently caused by the pressure backwards of the nasal growth. My impression from this examination was that there was some absorption of the basilar process of the occipital and of the sphenoid but subsequent X-ray studies failed to substantiate this. Although the hemorrhage was slight, the naso-pharynx and right nostril were tamponed with gauze soaked in tincture iodine and tincture benzoin for twelve hours. The ether anaesthsia being

skilfully given, had been light and the patient reacted promptly and without shock, breathing easily through both nostrils on the removal of the packing. Since that time he has done well and there is so far no suggestion of a recurrence. He breathes easily through the nostrils at all times and keeps his mouth shut even at night. His color has improved, he walks erect with his shoulders back instead of hunched forward as formerly, the frog-like appearance of his face is disappearing, his eyes are bright, appetite good and he is working. His only annoyance was that every morning a large bloody crust came away from the naso-pharynx for the first two months but that has now ceased. He is rapidly gaining in weight and strength. After some weeks the area of denuded bone had granulated over but had not been entirely covered with mucous membrane. There is a tendency on the part of the amputated right inferior turbinate to hypertrophy as I have seen occur in some cases of atrophic rhinitis when the ozenatous process has been arrested by vaccine, and the deviation in the septum is less apparent now that the pressure on its right side has been removed, thus allowing more air space on the left. It seems, however, that the left choana as well as the right was blocked by one of the fibromata. Nearly four months have elapsed since the operation.

The report on the specimens by Dr. A. G. Ellis of the Ayer Clinical Laboratory of the Pennsylvania Hospital was that they were pure hard fibromata.

The interest in this case seems to lie, first, in the presence of more than one growth; secondly, in the typical shape, position and attachment of each growth; thirdly, in the difficulty of removal by the cold snare, but the facility with which they were removed by avulsion; fourthly, the apparent completeness of removal and lastly, in the almost entire absence of shock or hemorrhage despite the rough manipulations. I will briefly discuss these points in detail.

1. Although I believe the presence of more than one true fibroma in an individual is a rare condition, I am compelled to believe that it existed in this case. On reviewing the re-

sults of the early nasal examination as outlined above this seems to be somewhat clearly indicated and the fact that two large masses were removed by avulsion, each having widely different attachments and without any visible evidence of having been attached to each other makes it almost certain, for I cannot conceive of any force that could be applied that would have torn any portion of these growths away from the main body. Indeed, so tough were they that the snare wires did not even leave a mark and the scissors on my instrument table failed to cut them after their removal. I am sure that, had they been parts of the same growth, that the second would have been delivered with the first.

2. Another reason for believing them separate entities is the shape and position of each. The naso-fibroma had its attachment in the region of the spheno-ethmoidal recess, a common situation for such growths, and moreover it was very distinctly pedunculated, the body of the tumor pressing the septum to one side and then extending backward into the vault of the pharynx and the spheno-maxillary fossa. On the other hand, the pharyngeal fibroma occupied the typical position for such a growth on the anterior bodies of the upper cervical vertebræ and the basilar process of the occipital bone. The attachments in each case were the periosteum, which stripped off leaving large areas of denuded bone, which indicates that they were not adhesions caused by pressure and erosion. Aside from the fact that the area of attachment in the nose was small and in the pharynx large, the two tumors were almost identical in size and shape, the nasal being, if anything, the larger and having a rather small prolongation or neck.

3. The hardness and toughness of the tumors, aside from the histological diagnosis of fibromata dura, would easily exclude the so-called soft fibroma or fibrous polyp which is frequently multiple but which is simply an ordinary mucous polyp that has undergone some fibrous change. These latter are easily removed with the cold snare, but a true fibroma rarely can be, although I thought it might be done with a very powerful instrument. The avulsion was accomplished

by exerting considerable force in different directions and finally twisting the growths loose, and doing the whole thing slowly.

4. The tumors were apparently removed root and branch as an examination of their bases showed periosteum and in no other place was the smooth surface broken; and examination of the nose and pharynx failed to reveal any evidence of a stump remaining. Avulsion, therefore, when it can be practiced, seems to me more ideal in this respect than the use of the galvano-cautery snare or sharp cutting instruments since these of necessity frequently leave the base of the tumor behind from which it may recur.

5. The absence of shock I can only attribute to the very careful and skilful way in which the anaesthetic was handled, the patient being just sufficiently "down" to be quiet and unconscious, and to the avoidance of very direct or sudden pulling on the forceps. Instead, minutes were consumed without relaxing the tension for a second and the tumors slowly and gradually loosened, as suggested by Stucky, and finally torn away. Of course, the points of attachment and the small amount of absorption were probably great factors. I saw one case a few years ago, in the hands of a very skillful colleague, which died on the table just after the avulsion of the growth. This case has been reported. The anaesthetic was not nearly as well administered as in my case, and I always felt that the cause of death was largely attributable to the anaesthetist. Milligan[27] cites a case of his own where an unexplained death occurred shortly after an otherwise successful operation for removal. The almost total lack of hemorrhage in my case, I think, was due to the slow avulsion and twisting loose of the tumors, to the fact that the entire tumor masses were removed intact and to the added fact that they were so very dense and therefore not very vascular. Where portions of a fibroma are left it is reasonable to suppose that the severed arteries cannot retract, just as was frequently seen in early tonsillectomy operations where portions of hard, fibrous tonsils were left in situ. In these cases the hemorrhage almost invariably ceased when the remainder of the tonsil was excised.

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*(Candidate's Thesis)*

# DIPHTHERIA CARRIERS, OPERATIVE TREATMENT*

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The full importance of the role played by diphtheria carriers in the dissemination of the disease is a matter of comparatively recent recognition. From a social and economic standpoint, the practical phase of the question is of considerable moment. Confirmation of this may be found by refering to reports of the results attained in controlling outbreaks of diphtheria in public institutions and schools by the detection and isolation of carriers.

The fact that diphtheria bacilli persisted after the convalescence of the patient was known as far back as 1894 through the work of Parks and Beebe[1]. Lennox Browne in his book on Diphtheria and its Associates, written in 1895, takes issue with the findings of Roux that the specific bacilli disappear with the clearing off of the membrane, or at most, a few days after. He speaks of one case, emphasizing it in italics, in which the bacilli persisted for one hundred and forty-six days after the membrane had disappeared. He recommended the removal of persistent cases to a convalescent hospital where isolation could be carried out.

One of the great advances in the study of the carrier has been the determination of the existence of two types, the primary and the secondary. The primary embraces those individuals who have never had the disease, who show an insusceptibility as evidenced by the negative Schick reaction, and in whom positive cultures of the diphtheria bacilli may be obtained from the nose and throat. The secondary type consists of those who have had the disease, have recovered from it, but in whom the bacilli still continue to be present. In both these types we may have either the nasal or pharyngeal carrier. Other progressive steps were made when the nasal

* From the Memorial Institute for Infectious Diseases.

carrier was shown to be of as much importance as the pharyngeal; when it was found that surface cultures from the throat could be negative, but that positive cultures could still be obtained from the depths of the crypts of the tonsils or the recesses of the adenoids; that there are virulent as well as avirulent forms of the bacilli; and that the finding of one or two negative cultures is not sufficient to allow the patient to be released from quarantine.

In the treatment of this condition many methods and remedies have been employed. Medicinal agents applied by applicators, sprays, gargles or vapors no doubt have a definite value but their limitation is evident if they cannot be made to enter the deeper part of the crypts of the tonsil. Kaolin acting in a mechanical way has also been found to be of value in a certain number of cases. Favorable results have been reported in the use of vaccins, toxins, antitoxins, endotoxins, antibacillary serum, and the application of various organisms such as the staphylococci, lactic acid bacilli, yeasts and molds. However, it must be taken into consideration that the use of some of these has not been entirely devoid of danger. Massage of the tonsils with the expression of the contents of the crypts may also have a place but is impractical in very young patients. One other method remains to be considered, the removal of the tonsils and adenoids. The necessity for the adoption of this procedure arose from the fact that a certain proportion of carriers resisted all forms of local treatment and would harbor the bacilli indefinitely. Before entering upon a further discussion of this method, certain general considerations in the carrier problem should be presented.

*Symptomatology:* Most of the patients do not present any distinctive symptoms. Pharyngeal carriers may have attacks of sore throat which resemble an ordinary tonsillitis in symptoms and appearance. Diphtheria bacilli are found in the exudate from the crypts. If these patients have a negative Schick reaction, these attacks will subside without the use of antitoxin. The type of tonsil, whether large and prominent or small and submerged, does not seem to present any difference in predisposing to the carrier condition. In nasal car-

riers there is usually evidence of a subacute rhinitis. In several young children examined recently, there was crusting about the vestibule, a thin mucoid secretion in the nares, a wide inferior meatus with the middle turbinate appearing relatively larger than normal, and the entire nasal mucosa considerably paler than normal. To epitomize, slight colds or sore throats would comprise the symptom complex presented by carriers.

*Virulence of the bacilli in carriers:* The general consensus of opinion among observers is that cultures from clinical cases of diphtheria are always virulent. In some carriers the bacilli may be avirulent. Nearly all the carrier cases I have operated have had the virulency of the bacilli tested by Dr. Geo. H. Weaver[2] and of those tested all were found to be virulent. He is in agreement with others in his finding that long residence of the bacilli does not affect their virulency to any great extent. As an illustration we have had under observation an infant about 15 months of age who has been a nasal carrier to our knowledge, for over 350 days. Bacilli grown from his nasal cultures and injected into a guinea pig gave a typical reaction with the death of the animal within twelve hours. Weaver further states that several times it has appeared that non-virulent strains have been secured from virulent ones, but it has not been possible to convert non-virulent bacilli into virulent types. The practical side of this question is the lack of necessity for the isolation of carriers of the non-virulent type and the increased necessity for a more rigid control and treatment of carriers of virulent bacilli.

*Pathology:* Sections from a number of tonsils removed were made by Miss Mary W. Brown[3] of the Memorial Institute Staff. She has embodied the results of her examinations in a separate report from which I take the liberty of quoting: "Bacilli, with large and small streptococci and diplococci were found chiefly in the crypts in the plugs of tissue, composed of cell debris, lymphoid cells, and polymorphonuclear leucocytes. The bacilli were found also in the tissues lining the crypts where the epithelium was very thin. There was little or no reaction in these places on the part of the tissues; no

new growth of connective tissue or accumulation of phagocytic cells. The cells in the vicinity of the bacteria stained diffusely and showed some slight karyorrhexis. Of six pairs of tonsils examined at some point and in some cases in several places, the epithelium of the surface of the tonsil was necrotic and the bacilli were found in the tissues showing that where there are lesions the bacteria multiply on the surface as well as in the crypts. With one exception, the bacilli were Gram positive."

This demonstration of the location of the bacilli in the tissues serves to explain the failure of local treatment in ridding the patients of the bacilli. The additional fact that the bacilli multiply where there are lesions on the surface may explain certain nasal cases where the carrier condition has persisted owing to the presence of a foreign body. Rabinoff has reported five such cases and there has been one at the Anne W. Durand Hospital. In all of these, prompt disappearance of the bacilli took place upon removal of the foreign body and the subsidence of the irritation which it had caused.

*Indications for Operation:* In order to avoid any misunderstanding, it is only proper that definite indications for operation should be laid down. In either the primary or secondary carrier, the Schick test should be negative. In other respects, the same conditions governing the operation under ordinary circumstances will apply. Myocarditis or nephritis resulting from the diphtheria toxins would seem to be contraindications. Neuritis may be a definite indication for operation in the chronic carrier, but in acute diphtheria the nerve involvement frequently takes place while the patient still shows clinical evidence of the disease and before the carrier condition can be said to have been established. The time to which the carrier condition should be allowed to extend before operation is performed, is a matter which so far has had only an arbitrary standard. In the primary cases naturally the operation may be done at any time. In the secondary type most investigators have taken three weeks as a minimum. There is such a wide variation in published statistics as to the length of time bacilli may be found after the disappearance of the

membrane that no definite time limit may be placed. The early view was that most of the patients were rid of the bacilli as soon as the membrane had disappeared or at most within a very few days afterward. A reference to several later investigations may be permitted. Thus Nuttall and Graham Smith[4] showed that 51.4 per cent. of patients were free from bacilli at the end of 30 days. Albert[5] states that 99 per cent. were free by the end of the fourth week. Rappaport[6] found that only 38 out of 100 patients were free in 30 days. This variation is so great that further investigation is desirable. From most of the statistics published, it is impossible to determine whether the time of residence of the bacilli is estimated from the inception of the disease or from the disappearance of the membrane. This probably accounts for the diversity of opinion. To take a conservative view in regard to the time for operation it would seem that between three and four weeks should elapse after the clinical recovery of the patient as indicated by the complete disappearance of the membrane and the restoration of the pulse and temperature to normal.

*Operative Treatment:* Here and there in the literature of the carrier problem, we find allusions to the removal of tonsils and adenoids in the treatment of the condition. Unfortunately, not many thought it worth while to substantiate their statements with any definite reports in regard to bacteriologic findings, before or after operation. One of the earliest accounts I have been able to find is that of Green[7] in 1908. He removed the tonsils and adenoids of a boy of 8 years of age in whom the bacilli persisted. Operation was done the third week after recovery from the disease. Antitoxin was given after the operation and the recovery was uneventful. A culture nine days later was negative. Albert[5] in 1913 gives as an indication for operation, markedly enlarged tonsils and the continuance of the carrier condition. On account of the wound produced he deems it advisable to give an immunizing dose of antitoxin before the operation "as cases of severe diphtheria in carriers following operation have been reported.

The Author[8] in March, 1916, reported six cases with prompt

disappearance of the bacilli after operation. Ruh, Miller and Perkins[9] about the same time gave the results of the treatment of carriers by biologic products and chemical substances which were far from satisfactory. In 19 patients operated upon for the removal of tonsils and adenoids, the results were entirely satisfactory with an average day of relief after operation of eight plus. They stated that negative cultures are seldom obtained until all the exudate formed after the tonsillectomy has disappeared.

| No. | Sex | Age | Cultures Nose | Throat | No. of days positive before operation | Schick | Operation | Result |
|---|---|---|---|---|---|---|---|---|
| 1 | M. | 13 | Neg. | Pos. | 57 | Neg. | Tonsils | Next 5 days Cult. Neg. |
| 2 | F. | 14 | Neg. | Pos. | 47 | Neg. | Tonsils | Next 6 days Cult. Neg. |
| 3 | F. | 21 | Neg. | Pos. | 23 | Neg. | Tonsils Adenoids | Cult. Pos. 2 days. Next 5 days Cult. Neg. |
| 4 | F. | 8½ | Neg. | Pos. | 38 | Neg. | Tonsils Adenoids | Next 5 days Cult. Neg. |
| 5 | F. | 11 | Neg. | Pos. | 31 | Neg. | Tonsils Adenoids | Next 6 days Cult. Neg. |
| 6 | M. | 8½ | Neg. | Pos. | 41 | Neg. | Tonsils Adenoids | Next 6 days Cult. Neg. |
| 7 | F. | 19 | Pos. | Pos. | 55 | Neg. | Tonsils | Next 8 days Cult. Neg. Nose Pos. on 5th day. Negative thereafter. |
| 8 | F. | 24 | Neg. | Pos. | 33 | Neg. | Tonsils | Next 4 days Cult. Neg. |
| 9 | F. | 5 | Neg. | Pos. | 30 | Neg. | Tonsils Adenoids | Next 6 days Cult. Neg. |
| 10 | F. | 3 | Pos. | Pos. | 82 | Neg. | Tonsils Adenoids | Throat Pos. for 4 days. Neg. thereafter. Nose varying for 17 days. Neg. for next 11 days. |
| 11 | M. | 7 | Pos. | Pos. | 27 | Neg. | Tonsils Adenoids | Next 7 days Cult. Neg. |
| 12 | M. | 7½ | | Pos. | 75 | | Tonsils Adenoids | Two Cult. in 10 days negative. |

Hubbard[10] also recognizes the limitations of medicinal treatment and reports one case of a carrier operated upon with favorable results. The cultures became negative immediately. He advises the use of local applications after operation.

Rabinoff[11] reports ten cases of removal of tonsils and adenoids with negative cultures after the disappearance of the operation membrane.

To the six cases previously reported, I wish to add six more. For the sake of brevity, all 12 cases are arranged in tabular form.

It will be noted that the carrier period ranged from 23 to 82 days. In nine of the twelve cases the throat cultures became immediately negative. In one it became negative after 2 days and in another after 4 days. Nasal cultures in several cases varied repeatedly from positive to negative for several days, the longest period being 17 days. In no case was any other result observed than that which follows operation under ordinary circumstances. The last case was in a patient whom I operated at another hospital. Owing to the distance at which he lived it was impossible to obtain more than two cultures within 9 days. Both were negative. No local treatment was employed in any of my patients after operation.

A summary of cases operated upon with careful subsequent observation is as follows: Ruh, Miller and Perkins, 19; Hubbard 1; Rabinoff, 10; and the writer, 12, a total of 42. No untoward result in any patient is in evidence. All were rid of their bacilli in a short time. In accomplishing this, the indication for operation was promptly and satisfactorily fulfilled. Among the resulting benefits were the release from quarantine, the reduction of hospital days thus releasing beds for other patients in need of hospital care, the restoration of the opportunity for the resumption of daily activities, and the lessened liability for the dissemination of diphtheria. Of all these factors, the latter is perhaps the most important. If the disease is to be stamped out our chief efforts must be turned toward preventive measures. By careful bacteriological work both from the nose and throat, we will be working in the right direction. A definite number of successive negative cultures should be required before the patient is discharged. As a minimum, the number should be at least six. When the bacilli persist in spite of any local treatment beyond a period of 3 to 4 weeks, the removal of the tonsils and adenoids is the most effective treatment and the most uniformly successful that has, as yet, been proposed.

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(*Candidate's Thesis.*)

# REMOTE RESULTS OF FOCI OF INFECTION IN THE NOSE AND THROAT.

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In selecting this subject it is fully realized that nothing new and startling is being offered, in fact it may seem a bit trite, but yet so great is its importance that one may be pardoned for repeating much that has been said by others. However, there are certain phases of this subject that have not been sufficiently emphasized, and which will bear repetition at this time. There is no question but that a great majority of foci of infection causing local and systemic disease occur in some part of the head, yet we must not ignore other infecting areas of the body as the gall bladder, appendix, prostate gland and seminal vesicles, pus tubes, infected bronchi, etc. The fact that so many infected foci occur in the field embraced in our specialty places a great obligation upon us, not only to search with pains taking care every possible area of infection within the field of our special work, but also to inform the profession in general of the great danger lurking in the cavities and crypts of the nose and throat. The teeth and the alveolar processes, and the middle ear and mastoid cells while not strictly coming within the scope of this paper, will on account of their intimate relationship be necessarily referred to but not discussed at length. It is a well known fact that the tonsils may receive their infection from an infected nasal sinus, or from a pus pocket around a tooth (pyorrhea alveolaris). Then again the sequence of an infection of the middle ear or mastoid from an acute sinusitis, or an acute tonsillitis, is one of the most frequent in our experience. The teeth with the adjacent tissues and bony processes may contain hidden foci which are difficult to locate, and which frequently require the aid not only of a dentist, but also the service of a competent Roetgenologist. Our work is becoming so concentrated, and so much is demanded of us in

the way of accuracy of diagnosis that medical men can no longer stand alone, but must work in closer co-operation with others engaged in special lines of work. There is no place where "Team work" counts more for the patient's good than in fathoming a hidden focus of infection which is causing some serious local or systemic disturbance. A competent up-to-date dentist who is able also to correctly interpret X-ray findings can be of the greatest help in reaching a correct diagnosis. While those who live in the smaller cities may lack some of the laboratory facilities afforded by the larger medical centers, yet they can by grouping themselves with careful workers in other fields of medicine and denstistry do much to locate hidden foci of infection. In this way only can we in these difficult cases merit the reward and satisfaction which comes from rendering our patient the greatest possible service in ridding him of the immediate cause of some local or systemic disease. In the majority of cases these patients first fall into the hands of the family physician, or the general diagnostician, and we are called upon to render judgment in our own field of work. Our task is often a difficult one for we are at times unable to say that the small sinuses of the head and the deep crypts of the tonsils are free from infection. There are, however, certain symptoms and physical evidences which tend to convict these areas of playing a role in the systemic infection. Of this more will be said later. The work of the dentist is a bit easier, for in the majority of cases a close examination of the teeth and the gum margins, together with a careful X-ray film of the alveolar processes, should reveal evidence of dental trouble. Certain rare forms of granuloma may not show on the film.

The question of focal infection as a factor in producing systemic disease is not new, for members of our profession have been diligent in urging its importance for a number of years. However, it is only within the last decade that the medical profession has begun to fully appreciate its importance. The close relationship of acute rheumatic fever, endocarditis, and chorea to acute tonsilitis was early recognized. Some writers, however, failed to interpret the relationship of these symptoms to the source in the tonsils as was evidenced by

the term "rheumatic sore throat." Even now we occasionally hear the laity use this misleading term. It is worthy to note that Osler, who has been a leader and pioneer in everything affecting internal medicine, in the second edition (1897) of his Practice of Medicine offered these theories as to the cause of rheumatic fever, (1) the metabolic, (2) the nervous and (3) the germ theory. Although he leaned to the germ theory at that time as to the causation, yet he speaks of the inconstancy of the micro-organisms found in the disease. In the later edition he classes acute rheumatic fever among "Specific Infectious Diseases," instead of the "Constitutional Disease." It is interesting to note in this early edition of Osler's Practice of Medicine (1897) the accuracy with which he describes the pathology of chorea as expressed in the following statement:

"Embolism of the smaller cerebral vessels has been found, as might be expected in a disease with which endocarditis is so frequently associated; and, based upon this fact, Kirkes and other have supported what is known as the embolic theory of the disease." He says further in reference to the microbic origin of the disease that, "In favor of this view it has been urged, as it is impossible to refer the chorea to endocarditis or the endocarditis in all cases to rheumatism, that both have their origin in a common source, some infectious agent, which is capable also in persons predisposed of exciting articular disease." It is noted that nothing is said specifically in reference to the tonils though strong argument is offered in favor of the infectious origin of chorea. It was easier to trace the association of acute rheumatic fever and chorea to an acute tonsilitis than it was later to associate the arthritis, endocarditis, nephritis, cholangitis, appendicitis and other remote lesions to a focus in the head which was apparently latent and giving no symptoms. It was not till the wonderful work of Rosenow (1) was published showing the transmutability of various strains of pathogenic organisms of the streptococcus-pneumococcus group, and also the tissue affinity of certain pathogenic coccii for certain tissues of the body, that the subject of focal infection assumed fresh interest. It explained certain difficult problems as the inconstancy of the type of organism found in

certain conditions as rheumatic fever. Rosenow by his own discovered methods of culture was also able to find in the fluids of inflamed joints, and the nodes adjacent thereto, organisms which had been overlooked by other careful observers. He was also able to produce by intravenous injections of rabbits with cultures obtained from infected areas corresponding lesions in a large percentage of cases. The same result was obtained by injecting the organism found in the original focus of infection. By altering the character of the culture medium he was able to develop in the organism affinity for certain tissues. For instance, Rosenow succeeded in cultivating the streptococcus pyogenes on media containing kidney extract which produced kidney lesions in animals inoculated. Tissues of other organs, as the gall bladder, appendix, etc., were treated in the same way, and there was developed a corresponding lesion in the inoculated animal. It was thought that these organisms acquire certain pathogenic elective tissue affinity in the foci of infection.

According to Billings, (2) "The main and fundamental princiciples which have been provided are: (1) The apparent confirmation of the transmutability of the members of the streptococcus-pneumococcus group in varieties of morphology, cultural characteristics, biological reactions, and also of general and specific pathogenicity. (2) The acquisition of pathogenic elective tissue affinity by bacteria in foci of infection in culture media and serial animal passage." To be convinced of this as a scientific fact it is only necessary to read carefully the writings of Rosenow and Billings.

It is natural that the upper respiratory tract should bear the brunt so to speak, of focal infections when we consider the complicated anatomical structure with enclosed cavities and pockets all covered by a delicate layer of mucous membrane. In this connection it is of interest to quote from the experience of George B. Wood, (3) "Experimental work has shown that the tubercle bacilli can pass through the unaltered cryptal emphithelium, and recently in a series of experiments I found that the anthrax bacilli will also penetrate through the normal cryptal emphithelium, and that to the exclusion of other por-

tions of the phryngeal mucosa. After gaining extrance to the tonsillar parenchyma the action of the toxin of the anthrax bacilli destroys the vitality of the tissues and points the way for a secondary invasion of staphylococci and other organisms."

Then again the nose and throat are constantly exposed to the danger of infection carried in the air and food. It is a well known fact that the mouth is normally inhabited by a large flora of saprophytic and parasitic organisms. It is generally agreed that the tonsils, including the lingual and pharyngeal glands (adenoids), take first place as a focus of infection, with the sinuses of the head, teeth and ear contributing their quota of systemic disturbances. After the first decade in life the importance of the teeth as foci of infection is greatly increased as the result of their decay, which requires capping, crowning and plugging. "Overdentistried" teeth become great sources of danger as infecting areas, and should at once arouse suspicion when endeavoring to locate the hidden focus.

A variety of micro-organisms have been isolated from foci in the nose and throat, chiefly the streptococcus hemolysans, S. viridans, S. mucosus, micro-occus catarrhalis, pneumococcus, staphlycocci, grippe bacillus, diphtheria, and pseudo-diphtheria, tubercle bacillus, and a few other pathogenic micro-organisms. The number of local and general diseases caused by the entrance of micro-organisms into the general circulation is a large one, and is being gradually increased. Diseases which are now known to be caused by foci of infection, and others which are probably due to confined areas of infection, form a large and important group. The character and type of a primary syphilitic focus in the nose or throat is so unlike the usual type of confined infections under consideration, and likewise so rare, that it may well be omitted from discussion.

The diseases which may have their origin in foci of infection in the head are acute rheumatic fever, endocarditis, pericarditis, myocarditis, chorea, pleuritis, arteritis, nephritis, gastric and duodenal ulcer, cholecystitis with and without gall stones, pancreatitis, appendicitis, neuritis, myositis, adenitis, Hodgkin's

disease, iritis, acute thryroditis, goitre, osteomyllitis, spinal myelitis, brain abscess, labyrinthitis, (4) erythema nodosum, herpes, urticaria, and bronchial asthma. The last named, bronchial asthma, is so different in its character and relation to the infected focus that it will be considered entirely apart from the other diseases. It does not seem advisable to divide the diseases considered to arise from foci of infection into acute and chronic, as is sometimes done, for often there is no sharp line dividing one from the other. The acuteness of the reaction to an invading organism may depend upon (1) the character and virulence of the organism, (2) their number, (3) the resistance, local and general, of the individual. Rosenow has shown that the local environment of certain organisms in a given focus particularly as to the oxygen tension, may not only alter their type morphologically and culturally, but also change their virulence. They may also develop a certain tissue affinity (tropism) in the focus which markedly affects the location and type of the disease. However, certain types of organisms show a predilection for the tissue found in the crypts of the tonsil or adenoids, the sinuses of the head, the teeth and the alveolar processes, or cavities of the ear. For instance, the streptococcus viridans is the organism most frequently found in disease of the alveolar processes, and is also found in the heart valves and in blood of patients suffering from chronic infective endocarditis. The streptococcus hemolysans is the usual organism found in acute septic sore throats, and likewise in the affected joints and endocardium. Tubercle bacilli are also found in the crypts of the tonsil and adenoids, from whence they break through the barrier and invade the glands of the neck and mediastinum. When this local resistance is overcome they extend still further and invade other tissues of the body.

Organisms from foci of infection reach the system either through the blood stream or the lymphatics, more frequently by the former. Through the act of swallowing, virulent material from the nose and throat may reach the general circulation from the gastro-intestinal tract. After reaching the general circulation they find lodgement in the capillaries and ter-

minal arterioles producing capillary embolism. Adami says it is more like a thrombosis. When bacteria are halted in the blood stream there is produced at the site a proliferation of the endothelial lining and an exudation of leucocytes and plasma cells. At times there occurs a hemorrhagic exudate, and there may be a resulting formation of scar tissue. It is now thought that appendicitis, peptic ulcer, and cholecystitis may be produced in this way by a lodgement of the organism from a focus in the small vessels of the submucus layer of the organs. General surgeons have often noted the occurrence of appendicitis following an attack of acute tonsilitis. It would likewise be easy for a focus in chronically diseased tonsils or elsewhere in the head to cause serious lesions in distant organs without attention being directed to the primary focus. This is usually what happens. Loeb (5) in 1910 called attention to a series of cases of acute nephritis due to tonsillar infection. On account of the hematogenous nature of the infection the type of disease in the kidney is usually a glonorulo-nexhritis. In cases of severe toxemia due to the absorption of soluable toxins, as in scarlet fever and diphtheria, there is produced a diffused nephritis (large white kidney). There may be more than one primary focus in the head, so it is not sufficient in searching for the origin of the systemic disturbances to say that the patient has a focus in the tonsils, the teeth area, the sinuses, or the ear. Should one focus be removed, and others be left to continue their discharge of virulent organisms into the circulation, our patients would not receive the benefit from surgical procedure which they had reason to expect. On account of the great difficulty in giving the tonsils a "clean bill of health," so to speak, however innocent they may appear, the writer is in the habit, particularly in adults, of calling in the services of a competent dentist who makes use of the X-ray films in his work, in order that no focus of infection in the teeth and alveolar processes may be overlooked. The sinuses of the head and the ear with the mastoid region should be examined with great care, calling into use the roentenologist when necessary. By proceeding in this way, we may spare our patient a needless operation.

Richardson has emphasized the importance of caution in diagnosis before resorting to needless tonsillectomy. French has been using a method of transillumination of the tonsils for the diagnosis of inflammatory conditions. We shall await his final report with interest. The hypodermic needle has been used in searching for hidden foci in the tonsil. Shambaugh rightly says "As regards the appearance of the faucial tonsil which is a focus for systemic infection, it is quite clear that the size of the tonsil is no index of the menace this structure may be to the individual." It is true that the small tonsil frequently contains a dangerous focus for systemic infection; on the contrary the writer is inclined to be more suspicious of the large tonsil in the adult. In children there is frequently seen a type of tonsil which projects prominently into the throat, and which is only slightly covered by the pillars. This type while *apparently* large is less likely to give systemic trouble on account of better drainage of the crypts. There is another type of tonsil which always arouses our suspicion. It is the type particularly noticed in children, which is *apparently* small, so well is it buried behind the pillars of the fauces. On removal, however, its size is found to be surprisingly large. It is covered by the pillars, and the mucous membrane of the palate interfering with the drainage of the crypts, especially those of the upper lobe, places the owner in constant danger of systemic infection. Coolige and Garland (9) have weighed tonsils removed and their results were surprising in showing only slight variation in size. The irregular shaped tonsil with fissues projecting beneath the surface of the gland should always excite our suspicion. When the mouths of the crypts show exudation of purulent material we have positive evidence of an infected tonsil. Firm pressure on the tonsil made through the anterior pillar will often reveal a cheesy purulent exudate. In chronic tonsillitis there is often noted a peuliar redness of the anterior pillars not noted in the relatively healthy gland. The tonsillar gland near the angle of the inferior maxilla is likely to be quite palpable in case of chronic tonsillitis though this is not invariably the case. It is remarkable how many people go about harboring these infected foci in the tonsil with no local

or systemic symptoms. However, when one's resistance is lowered by overwork, undernourishment, bad hygienic surroundings, exposure to heat or cold, overindulgence in alcohol, or excesses of any kind, the confined focus may become active and there may ensue symptoms of both local and constitutional disease. We have a parallel to this condition in tuberculosis of children which may remain latent for years in the glandular system, till later in life, when something lowers the resistance and active tuberculosis has its beginning.

In searching for foci of infection in the sinuses every means should be employed to reach a correct diagnosis of their condition. While X-ray findings are considered of more value than transillumination, yet the latter is often of distinct value, especially in the maxillary sinus, and is particularly valuable on account of its simplicity. Irrigation of the suspected sinus is the best proof of the presence of pus. The X-ray is absolutely essential for the examination of the teeth and alveolar processes, and is helpful in cases of suspected mastoiditis.

The pharyngeal tonsil (adenoids) on account of better drainage of its crypts is less likely to contain a focus of infection than the faucial tonsil, and yet tuberculosis of this gland occurs with a considerable degree of frequency. Many times inflammation in the naso-phrynx is evidenced by enlargement of the posterior cervical group of glands. Goodale has emphasized for us the importance of infections arising from the lymphatic glands on the posterior wall of the pharynx. The secondary foci of infection arising from the nose and throat may be more virulent than the original source of infection. The appendix or gall bladder may form secondary foci supplying pathogenic bacteria to other organs of the body. The establishment of these secondary foci explains why infectious arthritis continues to spread from one point to another, or to the endocardium, long after the primary focus has been removed. This fact should make us a bit guarded in our prognosis of these difficult cases, but yet our duty in removing the primary focus is none the less urgent. In our efforts to make a diagnosis of a focal infection we should take a careful history of the case. This is just as important as the physical findings.

especially is this true in reference to the faucial tonsils. The patient will often give a history of frequent attacks of tonsillitis, especially, in early childhood. He may have had scarlet fever or diphtheria which was followed by a "weak throat." Then there may be a history of an incomplete tonsil operation where a portion of the gland was left with the mouths of crypts sealed by scar tissue. A former cervical adenitis, or ear trouble, is very important. Inquiry should be made as to the occurrence of rheumatism. In young children this may be evidenced by what is known as "growing pains." The patient should be questioned in regard to the teeth, particularly in reference to plugging, crowning, and nerve killing. In regard to the nose the patient should be asked as to the occurrence of so called "nasal catarrh," freedom of nasal breathing, headache, and a history of an influenza attack. Many cases of chronic sinusitis have their origin in old untreated grippal infections of sinuses.

As preventative treatment is now the order of the day it would seem that we as specialists should do our part in educating the public through our patients to take those precautions which will in a measure safeguard them from the kind of infection under consideration.

Chronic focal infections which work such havoc on the human organism often have their origin in an acute infection of the nose or throat during childhood. We should teach that all acute colds are contagious, and so far as practicable patients suffering from the disease should be isolated. This is all the more important in children on account of their greater susceptibility, and because of the greater seriousness of both immediate and remote results. Hastings (11) has emphasized the harmfulness of swimming pools and sea bathing during attacks of acute rhinitis. There is danger of driving the infection into the sinuses of the head and the middle ear. In case of the public swimming pools there is likewise danger from a public health standpoint. Patients with acute colds should be taught to cough and sneeze into gauze to be burned just as our tuberculosis patients are required to do. The

latter is far less contagious than the former. The patient should be cautioned in blowing the nose to obstruct only one side at a time. There is also a danger in nasal douches in the hands of our patients, and their use is seldom justified. Complications of an acute cold are much less likely to ensue if a patient from the first is put to bed and the usual local and constitutional treatment instituted. Many cases of acute rhinitis are complicated with sinusitis, and Davis (12) has shown how frequently acute ethmoiditis occurring in children is overlooked.

Again ethmoiditis at this time may be the starting point of a chronic process in later life. There is another danger in the increasing popularity of sleeping porches for young children in all kinds of wintry weather. If used in cold weather at all there should be ample protection from the wind. In certain cases of acute rhinitis, laryngitis, and bronchitis cold air is surely harmful. Morse (13) has emphasized this in cases of bronchitis and laryngitis complicating pneumonia. Mothers should be taught that earache is not to be regarded lightly, and requires more than the instillation of sweet oil or laudanum. They should likewise be impressed with the fact that a running ear is a positive danger, and requires the most skillful care a specialist can give. Many chronic foci in the ear and mastoid have their origin in the neglected ears of childhood. It is a common observation that the number of ears requiring mastoid operations has been greatly reduced since tonsillectomy and adenoidectomy have become more general and likewise more thorough. The public should be instructed in reference to the importance of oral hygiene, and the dentists can contribute their share in this direction. Thorough cleaning of the teeth with a good brush is absolutely essential to keep the teeth in a healthy condition, and to prevent deposits from forming around the gum margins. To this end a regular visit to the dentist is necessary, and attention should be given to early decay of the teeth before extensive necrosis has taken place. Contrary to the general opinion, the first teeth should receive the same care as the permanent teeth. On account of the close relationship between the roots of certain teeth and the antrum

their care assumes a two-fold importance. As already referred to there is a close relationship between infected gums and alveolar processes and tonsillitis.

The treatment of focal infection in the nose and throat depends upon whether the case be acute or chronic. Obviously the treatment of an attack of acute tonsillitis with arthritis will differ from that of a chronic tonsillitis with joint involvement. There are two well established methods of relieving an individual of an infected focus, one by entire removal, and the other by drainage. In chronic tonsillitis we restore to the former, and in sinusitis we practice drainage. In acute tonsillitis, with or without secondary foci of infection, it is not advisable to remove the tonsils. Billings says the cause of acute rheumatic fever is not materially affected thereby. Without going into the details of the medical care of acute tonsillitis the writer would urge the use of salicylic acid in sufficient dosage as it seems to have a specific effect on the streptococcus rheumaticus or its toxin. Barnes (14) advises swabbing the tonsils with 50 per cent. nitrate of silver if seen early in the course of the disease. A peritonsillar abscess should be incised as soon pus formation has taken place, which is usually about the third day, as fatal septicemia may result from too long delay of this surgical procedure. Without going into the details of the management of acute sinusitis, suffice it to say, its care should not be neglected. An early convalescence depends upon ventilation and drainage. Shrinking the mucous membrane of the nose with such agents as a weak solution of cocaine or menthol solution is desirable. The Coffin (15) suction apparatus is often used to facilitate drainage from the infected sinus. Irrigation of an infected antrum preferably through the natural opening is essential for the successful treatment of acute maxillary sinusitis. The importance of early incision of the drum membrane in acute otitis media has been so generally recognized that it seems unnecessary to emphasize it at this time.

Chronic foci of infection in the nose and throat as a rule demand surgical treatment. The tonsils being the most im-

portant will be considered first. Nothing will be said as to the technic of their removal except that the operation must be thorough with a minimum of trauma to the surrounding tissues. So serious for the patient is the systemic disturbance arising from foci of infection in the tonsils that we are rarely justified in the use of half-way measures as incision of the crypts, or the use of the cautery or the curette. In cases of very slow coagulation time of the blood, or extreme old age, we may be justified in doing less than a complete tonsillectomy. Albuminuria with casts instead of being contra-indication may be a positive indication for tonsil removal. This condition of urine in two recent cases of children operated on by the writer cleared up promptly after tonsillectomy, and the ether itself had no harmful effect as shown by the urinary findings following the operation. Billings says in this connection, "Infectious acute nephritis due to specific elective tissue affinity of certain bacteria, especially members of the streptococcus group demands an early removal of the focal cause. By this means death may be prevented and if the anatomical injury to the kidney is not too great the function may be preserved to a degree consistent with health for many years." In adults, however, with kidney complications local anesthesia should be used.

Valvular heart disease, if compensation is not broken, is no contra-indication for tonsillectomy. Though the operation cannot repair the injured valve, it might spare the patient a fresh invasion of bacteria with serious consequences to the valvular lesion.

In chorea personal experience with tonsillectomy and adenoidectomy has been so satisfactory that the author is inclined to urge operation in these cases in the absence of other foci of infection. Three recent cases cleared up promptly and suffered no serious disturbance incident to the operation. The fact that they had no complications with secondary foci in the joints or elsewhere may explain the favorable results following the operation. Crowe on the other hand with a large experience advises against operation in chorea.

Without attempting to give the dental treatment for infection of the teeth and alveolar processes the dentist attitude is not infrequently too conservative, showing a tendency to treat these infected foci where an extraction of the affected tooth would better safeguard the patient's health.

Bronchial asthma as distinguished from the so-called cardiac and renal asthma is now regarded in the light of an anaphylaxis. This phenomenon was first noted by Theobald Smith, and later studied by Rosenau and Anderson (18). Auer and Lewis (19), and Meltzer (20) also showed the similarity of anaphylactic paroxysm to bronchial asthma. They explained that it was due to a spasm of the bronchioles, and not caused by a nervous reflex, as was so long held by many clinicians. They were able to demonstrate the symptoms of spasmodic asthma in guinea pigs after severing all nervous connection with the spinal cord. Babcock was one of the first clinicians to emphasize the connection between bronchial asthma and foci of infection in the nose. Since that time Mathews, Lewis and others have added their clinical observations. In the discussion of this subject in the light of foci of infection consideration will not be given to certain types of asthma which are intimately associated with the ingestion of certain foods, and with asthma and hay fever due to pollens, and emanations from the horse.

We must regard syasmodic asthma in an entirely different light from other systemic diseases which have their origin in foci of infection in the nose and throat. In the diseases previously considered there was a bacteremia with emboli in capillary vessels of various organs of the body. In asthma, however, we have the absorption of a protein substance to which the cells of the body have been sensitized; it may be a proteid of bacterial origin or in some cases the products of mucus or pus found in the sinuses. Mathews from his experiments reached the conclusion that "mucus or pus either infected or sterile is capable of acting as antigen, and that the products of bacteria are not essential in producing either sensitization or shock." Whether these findings can be wholly

accepted or not, the fact remains that the relief of our patient depends upon ridding him of these areas supplying the system with sensitizing proteids. The frequent association of nasal polypi with asthma has long been noted, but it was thought that the former was only a symptom or local manifestation of the constitutional disease. Latterly we have regarded nasal polypi as a symptom of chronic sinusitis often due to hyperplasia of the ethmoid cells, and not necessarily a purulent ethmoiditis (Beck). The treatment of this type of asthma must be based on an accurate diagnosis obtained from an accurate history of the case, followed by a thorough examination. Carefully made X-ray plates are of great service in determining the condition of the sinuses. That most brilliant results may be obtained in the treatment of those cases where one sinus alone is involved, has been demonstrated by two recent cases. The antrum cases seem to respond particularly well to treatment. The structure of the ethmoid offers difficulties which may require time and patience in eradicating the focus. The secret of success in all cases is thoroughness of drainage. In January of the present year (1917) the writer operated upon a man of middle life who had come from New England to Asheville seeking climatic relief for his asthma. After spending several months in the mountains without benefit he decided to have an operation performed upon his nose. His was as unusual condition in that he had a single pendulous polypi attached in the region of bulla ethmoidalis on the left side. This was removed and the cells adjacent to the point of attachment were curetted. As was to be expected he had asthma in rather severe form for several days following the operation, but since that time to the present day, more than three months, he has not a sign of asthma in spite of several attacks of "cold." Frequently we encounter cases where the results of operations are not so satisfactory, but failure or partial success in these cases may be attributed to our inability to eradicate the foci of infection in the nose, or to the presence of foci elsewhere in the body. Unfortunately there is often a complicating bronchitis, or a bronchiectasis, which is a source of the sensitizing proteid. It may be just such cases that

Freudenthal and Horn have had success through the establishment of better drainage by the passage of the bronchoscope. Although the foci of infection in asthma are most frequently in the sinuses yet we must not disregard other foci in the head and elsewhere in the body. Babcock reports a case which kept well so long as the gall bladder was draining, but in which there was a return of the spasmodic symptoms with a stoppage of discharge from the infected gall bladder.

A consideration of this subject would not be complete without a brief reference to the use of so-called vaccines in the treatment of foci of infection in the head, for even the enthusiastic advocates of this form of therapy do not pretend that it will supplant surgical treatment in these chronic infected areas. It was held for a long time by careful workers in this field of medicine that the action of vaccines on various infectious processes was specific, and that the only ones worthy of consideration were the autogenous vaccines It was very difficult at times to isolate the particular organism which was the cause of the inflammatory condition, especially was this the case in open foci in the nose and throat. Then again as previously referred to, recent workers have shown how certain pathogenic organisms, particularly of the streptococcus group, vary as to their strain under different environments which markedly alter their pathogenicity and likewise their selective tissue affinity. These recent discoveries have necessarily modified our views as to the efficacy of autogenous and stock vaccines. However, we cannot ignore the clinical experience of such careful workers as Coates (27) and others, particularly in chronic suppurative ears. There seems to be ground for hope that in the future there will be developed a non-specific protein substance which on injection will contain offensive and defensive substances against the invading organism and its toxin. Without going into the theory as to their action it is sufficient to note that the favorable results attending their use seem to be closely associated with and dependent upon the violent reaction, the chill, high temperature, and marked leucocytosis following their use. It is to be hoped that these careful laboratory workers will continue their effort along this

line till an efficient antigen is found which will be without danger to the patient.

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## NEW INSTRUMENTS.

### *Shield Hooks and Manikin of Esophagus and Bronchi.*

Dr. Thomas Hubbard presented a manikin of the tracheo-bronchial and esophageal tract, designed for practice, proving of instruments and illumination, and demonstrated a method of dislodging and removing impacted bodies like open safety pins and rough fragments of bone.

The shield hooks have the merit of safety in that they are not liable to become entangled and can be easily withdrawn. (Especial attention was directed to the danger of using any instrument that cannot be readily released). The manikin and the shield hooks are made in a set of four, two large and two small sizes—rights and lefts, by V. Mueller & Company.

# Obituary

## JACOB HENRY HARTMAN

Dr. Jacob Henry Hartman, born in Baltimore, November 15, 1847, was the son of J. P. Hartman, an old resident of that city. His early education was received in private schools. Later he was graduated from Princeton University, and in 1869 from the medical department of the University of Maryland, having been an office student of Professor Nathan R. Smith, the most distinguished practitioner of the locality of his time. From 1869 to 1872 Dr. Hartman studied with the best masters of laryngology in Paris and Vienna, London and Berlin. He then returned to his native city and took up the practice of the specialty of diseases of the nose, throat and chest. From 1874 to 1877 he was lecturer on Diseases of the Nose, Throat and Chest at the Washington University of Baltimore; from 1875 to 1882 attending surgeon at the Baltimore Throat Dispensary; and when in 1882 this Dispensary merged with other special dispensaries and formed the Baltimore Eye, Ear and Throat Charity Hospital, he became one of its staff of surgeons and served the institution for thirty-four years. He was one of the founders of the American Laryngological Association in 1878, and was elected Vice President in 1883-84, and again in 1890-91, and President in 1903. He died July 28, 1916.

In his relations with his friends, Dr. Hartman was cordial and loyal. His every act was that of a man of culture, refinement and dignity. The standards he set for his own thought and action were high, and he was firm and fearless in the stand he took concerning what he thought was right or wrong. These standards he likewise applied to others, admiring those things which met with his approval and condemning in equal terms what he had reason to disapprove. His sense of duty in all the relations of life met the highest demands. This was particularly manifest in his professional work, and was shown

equally in private practice, in the hospital and in the dispensary.

With Dr. Hartman the practice of medicine was not a commercial undertaking; he regarded it as a lofty profession, a service to human kind. It was in this spirit that he applied to it himself, his fine judgment, his wide knowledge, his kind sympathy, his operative skill.

On the occasion of the presentation of a portrait of Dr. Hartman to the Medical and Chirurgical Faculty of Baltimore, Dr. John Mackenzie said:

"In receiving this portrait of my old friend, Dr. Jacob Hartman, my heart and soul go swiftly back to other and joyous hours when the old Hospital on Franklin Street was founded by Russell Murdock, Samuel Theobald, Samuel Johnston, Jacob Hartman and John Mackenzie. Those were halcyon days. I doubt whether there ever came together anywhere a company of more congenial and friendly souls than those five men, working earnestly together, in perfect harmony, without friction, without antagonism, without jealousy, laboring happily in their congenial home, a world where science and good fellowship met together and walked hand in hand.

"A gentleman in every sense, a true and steadfast friend, a lovable nature, a delightful companion both at home and in our walks abroad, Hartman was a type of the older school of medicine. I knew him in friendly rivalry and intimate association for over thirty-four years, and in all that time I can truthfully say that there was not one harsh sound, no discordant note to disturb or mar the friendly feeling and good comradeship that existed between us, and this kindly spirit will live in my memory as long as I live, a happy and priceless recollection."

## WILLIAM EVANS CASSELBERRY

Dr. William Evans Casselberry was born in Philadelphia on September 6, 1858, and died July 11, 1916. The family from which he came had resided in or near Philadel-

phia since Colonial times. One of his grandmothers was of the family of Dr. Benjamin Rush.

Dr. Casselberry received his early education in Philadelphia, graduated in medicine from the University of Pennsylvania in 1879, and served as a resident physician in the Germantown Hospital. Following this, he spent some time abroad studying in Vienna and Berlin and working with Sir Morell Mackenzie. Returning home, he established himself in Chicago, restricting his practice to diseases of the upper air passages, in which specialty he built up a large practice. In 1883 he was appointed to the position of Professor of Materia Medica and Therapeutics in the Northwestern University Medical College, transferring in 1894 to the Professorship of Laryngology and Rhinology in the same institution and developing there a clinical service valuable for teaching purposes. He also attended out-patient clinics on the throat and chest. For many years he has been attending Laryngologist and Rhinoligist at St. Luke's Hospital.

Dr. Casselberry was a Fellow of the American Medical Association, and formerly Chairman of the Section on Laryngology and Otology. He was a member of the American Academy of Ophthalmology; the American Clinical and Climatological Association; the Chicago Laryngological Society, the Chicago Medical Society, the Chicago Academy of Sciences, the Chicago Tuberculosis Institute; the Illinois Medical Society; the National Society for the Study and Prevention of Tuberculosis; the Physicians' Club of Chicago; Fellow of the American College of Surgeons, and a former President of the American Laryngological Association. He took an active part in the meeting of the Ninth International Medical Congress which convened in Washington in 1887. Of social and non-professional organizations, he was a member of the University Club of Chicago and of the Onwentia Golf Club of Lake Forest.

We shall remember Dr. Casselberry as a man of more than medium height and slender build, dark haired and with brown eyes of a remarkably direct and piercing quality. Full of energy and untiring in his activities, he rarely allowed

himself to be diverted from his professional interests, even for recreation. While at work with patients, he permitted no diversions of conversation to interrupt the concentrated attention which he gave them. In his examinations and treatment he was most thorough and painstaking.

As a speaker, he was fluent and often eloquent, possessed of a rich vocabulary and considerable art in the presentation of his ideas. As a writer, he was clear, accurate, and painstaking. Moreover, he was a clever draughtsman, and himself made the many excellent illustrations which accompanied his numerous contributions to literature.

Never of entirely robust constitution, the compilation of a text-book on laryngology which he had partly written, was some years ago interrupted by ill-health.

Dr. Casselberry suffered a hemiplegia in December, 1915, which incapacitated him for work. He was however slowly improving until July 10th, when he was seized with an attack of angina pectoris which caused his death, at his summer home in Lake Forest. He is survived by his wife, a daughter and two sons, also by his father and sister.

His devotion to the American Laryngological Association was unwavering and has been made more than ever apparent since his death.

## DAVID BRADEN KYLE

Dr. D. Braden Kyle, of Philadelphia, died October 23, 1916. While not of strong constitution, such was the energy of his character and the endurance of his physical powers that he was able to attain the highest success in whatever work of professional interest he undertook.

Returning from an invigorating out of door vacation in California, apparently in buoyant health, it seemed that the attack of pleuropneumonia from which he suffered must have been contracted while treating a patient with an infected throat.

Dr. Kyle was born in Cadiz, Ohio, October 11, 1863. He was the youngest son of Samuel W. Kyle, whose family, com-

ing originally from Kyle in Ayrshire, and descended from Ames Kyle, first vicar apostle of Scotland, was one of the oldest in the State.

His mother was of English extraction and a lineal descendant of Thomas Cross, who came to this country in 1746 and served under Washington in the Revolution.

Entering from a private school, he graduated from Muskegon College and came to Philadelphia when he took up the study of medicine at Jefferson, at the same time taking private courses in bacteriology, pathology and nervous diseases with the best instructors of the time. He was also an office student in surgery with Professor W. J. Hearn, and in graduating (in 1891) was awarded a gold medal for an essay on "The Pathology and Treatment of Tetanus."

Soon after graduation he was appointed Assistant Demonstrator in the Pathological Department of Jefferson Medical College, and held that position until 1896, when he was appointed to the chair of Pathology, which place he held for one year. Meanwhile he had begun to practice in Philadelphia, and had established a private laboratory for work and instruction in clinical microscopy, bacteriology and pathology, giving a regular course of three years. In 1894 Professor Da Costa became associated with him and a course in surgery was added. The demands of the laboratory soon grew to such an extent that in 1896 the course was discontinued, and Dr. Kyle concentrated his energies upon investigations made in his own private laboratory. In 1896 he was elected Professor of Laryngology in the Jefferson Medical College, and continued to hold that position up to the time of his death. In 1906 Dickinson College conferred upon him the degree of Master of Arts.

For a number of years he was laryngologist and otologist to St. Mary's and to St. Agnes Hospitals.

Dr. Kyle was elected Vice-President of the American Laryngological Association in 1902, and President in 1911. He was a member of the American Otological Society, the American Climatological Society, and in 1900 was President of the American Laryngological, Rhinological and Otological

Society. He was a Fellow of the American Medical Association, of the College of Physicians at Philadelphia, and of the Phi Alpha Sigma Medical Society. For some time he was a member of the Philadelphia Board of Health. He was a delegate to the International Medical Congresses at Budapest in 1910, and at London in 1913.

At the time of his death he was about to finish a book upon "The Relationship of the Diseases of the Nose and Throat to the Internal Secretions."

Dr. Kyle's admirable text book on "Diseases of the Nose and Throat" first appeared in 1899, since when five editions have been printed. In its revised form it continues to receive the appreciation which it so well deserves as one of the standard classics in Laryngology. His many theses, highly original and written in fine scientific vein, are mainly in the field of advanced medicine, and are the more valuable because of the popularity in general of surgical subjects and of the scarcity of authors capable of dealing with the other realm.

Dr. Kyle was a man of untiring industry, and with all his many activities no effort in behalf of a patient was too great, whatever the standing of the subject. Devoted to his friends, children particularly appealed to him. The gentle kindness of his nature, his self-forgetfulness and friendly outgoing of affection toward them, quickly endeared him to them all.

The amount of work which he imposed upon himself was unusual. He rose at 5:30 in the morning and began operating at Jefferson at 6:30 so that he could himself watch the patient during the day. One of the secrets of his success was that he never left to subordinates or assistants the care of a patient after operation, thus following the custom of that best of all exemplars, Dr. J. Solis Cohen. Completing his work at the hospital he conducted a large private practice, and in addition devoted much time to research and writing. For recreation and exercise he depended mainly on golf. His social activities may be judged from the clubs of which he was a member, as follows: The University, Union League, Art, Racquet,

Philadelphia Country, Merion Cricket, St. David's, Huntington Valley.

In 1911 he married Miss Jeanette E. Smith, daughter of Colonel Thomas J. Smith of Philadelphia.

A comparatively young man and at the height of his activity, with many plans in view for the advancement of medicine, his loss is in no ordinary degree serious.

## GEORGE HUDSON MAKUEN

Dr. George Hudson Makuen, the son of George and Ellen Gertrude Makuen, was born at Goshen, New York, July 16, 1855, and died at his old home February 21, 1917.

He prepared for college at the Centenary Collegiate Institute, Hackettstown, New Jersey, and entered Yale in January, 1881. Graduating in 1884, his undergraduate career was one of unusual success. From its beginning he gave evidence of ability in many directions, standing well in scholarship and taking prizes in English composition and in oratory. Popular and beloved, he attained the highest social distinction within the gift of his fellows, as proved among other evidences by the securing of the much coveted election to Scroll and Key.

For several years after graduation he taught in the National School of Oratory in Philadelphia, and at the same time studied medicine. He received the degree of M.D. from Jefferson Medical College in 1889, and after several years spent in general practice devoted himself to laryngology and otology.

Meanwhile he gave especial attention to the study of defects of speech and voice, and was in 1897 elected Professor of speech defects at the Polyclinic Hospital and College for Graduates in Medicine in Philadelphia.

In 1899 Dr. Makuen was elected President of the American Academy of Medicine, and in 1904 President of the Yale Alumni Association of Philadelphia. In the latter position he made many addresses before various college bodies. In 1912 he was President of the American Laryngological, Rhino-

logical and Otological Society, and of the American Laryngological Association in 1916. He was a delegate to the International Medical Congress held in Budapest in 1909.

He was a Fellow of the American College of Surgeons, of the College of Physicians, the Medical Club, the Alpha Mu Pi Omega Medical Fraternity, and of the University Club and the Arts Club of Philadelphia.

He was consultant to St. Mary's, Chester, and Frederick Douglas Memorial Hospitals, and consultant in defects of speech at the Vineland Training School. As a practitioner of laryngology Dr. Makuen attained the highest rank. A wise and conservative clinician, he was at the same time a skilful and successful operator, showing rare judgment in the selection of his cases and superior tact in their management.

The field in which he excelled, however, was that of the defects of speech. Hesitating to accept the more or less unpractical theories of European authorities, he made careful studies of the principles of articulate speech, practically tested his views with long continued and painstaking thoroughness upon large numbers of pupils. Thus he succeeded in placing before the world a series of contributions extensive, original and unquestionably superior. As an authority upon the mechanism and control of the voice he stood without a rival either here or abroad.

Broad minded, splendidly trained, with a fine intelligence for the work and widest facilities for its practice and study, it will probably be many years before any aspirant for honors in this department will arise to take his place as its most important and valuable champion.

We, who have known him from boyhood, have lost a loyal, dignified and much beloved friend.

## EPHRAIM CUTTER

Ephraim Cutter, M. D., M. A., LL.D., was born at Woburn, Mass., September 1, 1832, and died at West Falmouth, Mass., April 24, 1917. His father, Benjamin Cutter, M.D., A.M., practiced in Woburn from 1827. From him he inherited his

love of medicine and from his maternal grandfather, Amos Whittemore, the ability to invent, and the capacity to direct a mechanic what to do.

Dr. Cutter fitted for college at Warren Academy and graduated from Yale in 1852, receiving the degree of M.D. from Harvard in 1856 and from the University of Pennsylvania in 1857. His preceptors in medicine were his father, Oliver Wendell Holmes, Henry I. Bowditch, and Josiah P. Cooke. He received his degree of LL.D. from Grinnell College in 1857.

He was a member of many American and foreign scientific societies, a voluminous contributor to medicine and collateral sciences, an ingenious discoverer and inventor of instruments, procedures, and operations in laryngology, gynaecology, microscopy, general medicine, and surgery.

His medical undergraduate course was alternated year by year between Harvard and the University of Pennsylvania. While pursuing his undergraduate college work at Yale he entered the newly opened Sheffield Scientific School, for the study of chemistry and the use of the microscope. He entered into practice with his father at Woburn, in 1856, at the same time taking up office work in Boston and removing to Cambridge in 1875, where until 1881 he still continued the Boston office. In 1881 he removed to New York City, whence after twenty years of professional activity he retired to West Falmouth, where he ended his days.

He visited Europe in 1862, 1889, and 1890, to instruct and to be instructed by the master minds of medicine. In 1862 he instructed Europe in the value of veratrum viride. His social activities in Scotland and England were largely controversial on the issues of the Civil War. One of these was a breakfast tendered him by Sir James Y. Simpson, and another an interview with an editor of the London Times,—the editor stating that if newspaper writing could do it the North was to be subdued. Dr. Cutter's answer was that the issue was one of ballots versus bullets, since ballots had elected Abraham Lincoln and bullets had been fired at the autonomy of the United States at Fort Sumter.

In 1889 he represented the American Medical Association at the meeting of the British Medical Association at Leeds, and presented various communications at the International Congress in Berlin in 1890. Of the 250 guests invited to the Imperial reception at Potsdam, he was one.

Dr. Cutter was a man of many sided interests and accomplishments. He was a diligent student of morphology, and in this department, as in others, showed much originality and keen power of observation. As a master of the microscope, he deserves much consideration. He not only excelled in the use of this instrument, but with his fine mathematical mind was able to suggest valuable improvements. His successful use of the 1/75th objective with direct lamp-light was enough to prove his eminence in this department. In the work of photomicrography he was a pioneer. Among other observations upon the morphology of the blood, he antedated Metchnikoff's leucocytosis by nearly ten years.

Becoming interested in the early decay of children's teeth, he began investigations upon white flour, and antedated by over forty years the present crusade against the use of denatured and decorticated wheat, thereby earning the opprobium of Mrs. Eddy who animadverted upon him in several editions of her so-called "Science and Health." Cancer, he defined over thirty years ago as "tissue rioting in the body system."

Undoubtedly one of the most interesting attempts of Dr. Cutter's life was his effort to invent an instrument for the demonstration of the larynx. This was constructed for him by Mr. Alvin Clark, the great maker of telescopic lenses. It consists of a shell or brass cylinder open at one end and closed at the other. On the under side, near the closed end, there is an opening. The cylinder is passed into the pharynx, the eye of the observer applied to its open end, and the larynx,—as in any laryngoscopic mirror, is supposed to be seen reflected in a mirror above the opening near the closed end of the cylinder. He says of this invention: "I can only add that in 1856 I had a most earnest desire to see my own larynx. I heard of Garcia's invention, but could not find an instrument representing

it, so had to invent one for myself. Taking the microscope as a pattern, I made drawings and explanations to Alvin Clark and Sons, who constructed a laryngoscope for me in 1859. I did but little with it. I saw Czermak in Paris, in 1856, demonstrate his own larynx; I also saw the photographs of his own larynx. After this, I had my tinsmith construct my laryngoscopes out of tin mirrors. They were successful. In 1866, I photographed my own larynx. I was fortunate enough to finish Czermak's work as to the anterior insertion, he not having been able to demonstrate it."

Other reminiscences of Dr. Cutter are of great interest. He says: "I remember calling upon Horace Green at his office. He was a very pleasant man. With reference to the patient about whom I consulted him, he said that I had passed a sponge probang with nitrate of silver into his trachea. As I could not see, I could not determine the matter for myself. It was probably as he said, but my experience at the time made me think that it might have been the œsophagus. Later, in Vienna, in 1862, Semeleder showed me the three valves of the larynx in action on myself. In 1865, I became acquainted with Louis Elsberg, a man of great inventive genius and one of the best electricians I have ever met. We studied together things connected with laryngology, and it was delightful to us both to see each other's inventions. His technique and tactile gifts made patients like to be treated. I should also mention Dr. J. Solis Cohen, although he is still living to bless the world. He and Elsberg were like Damon and Pythias, one in New York, the other in Philadelphia. It was a delightful event for me when they came to Woburn to assist in my operation for removal of an intralaryngeal growth by thyrotomy without the tracheotomy tube. Some of my cases were very interesting. The first, operated upon in 1866, was without recurrence for twenty years. Another patient, in whom new vocal bands were made by scissors, recovered phonation.

"In the course of my long experience with laryngology, I have made the following observations:

"Ulceration in the pyriform sinus often causes cough.

"Pharyngitis sicca, easily cured by drinking one pint of hot water one hour before each meal and before going to bed.

"Adenoids just behind the middle of the lateral pillars and the soft palate are often the cause of throat trouble.

"A student of music could not reach high C. Treatment of the vocal bands was without avail. An adenoid was treated with liquor persulphide and she recovered this note.

"Uterine diseases will cause throat troubles.

"A right and left Eustachian catheter shown at the International Congress at Moscow conforms to the internal angles.

"Speech and song differ entirely in the length of the music vowel sounds. Thus, phonation is subject to musical laws; hence phonation should be in the chord of the key-note of audition. Tremolo singing is unlaryngologic and indicates partial paralysis of the vocal cords. Laryngologists will do well to lay down laws of speech and singing, because they are functions of the larynx belonging to its physiology.

"The general condition of the system should not be forgotten. It is of importance to see that the system is well fed and nourished."

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Kyle, Makuen, Hartman, Casselberry, Cutter,

men of thorough preliminary education, firmly grounded in general medicine, energetic workers, earnest students and untiring scientific investigators, never ceasing in their efforts to improve themselves and their specialty and to increase the common stock of knowledge pertaining to it. With them, as with every other one who has ever been successful, steady, continuous, intelligently directed effort has been the basis of all they have attained.

## PROFESSOR FERDINANDO MASSEI.

Prof. Ferdinando Massei, of Naples, was born July 25, 1847, and died March 7, 1917.

As has been well said of him by Sir St. Clair Thomson "Italian Laryngology has lost its dean and all who knew

him have lost a dear friend." To the truth of this statement the writer can well testify.

An almost lifelong acquaintance with him, begun at a now remote International Medical Congress and sustained through frequent correspondence, through meetings at other congresses, and through many kind hospitalities received during various visits at Naples, render his loss to the writer a very genuine one.

A well born Neapolitan, Massei lived, worked and died in his native city. Early impressed with the importance of laryngology, he adopted that specialty and soon after graduating in medicine undertook a protracted course of study in the leading centers of Europe, under such preceptors as Morell Mackenzie of London, Fauvel and Mandl of Paris, his distinguished predecessor Prof. Cozzolini, of Naples, and others of note.

In 1869, he returned to Naples and soon established himself as a skilled specialist. At this time the leader of Italian laryngology was our late Honorary Fellow Prof. Carlo Labus, of Milan, a man whose contributions to science placed him among the very foremost of his contemporaries. While others in Italy attained a certain amount of distinction there seemed to be no one of particular ability south of Rome. Massei, already located in the metropolis of his country, represented laryngology for the whole of the densely populated region of Southern Italy and of Sicily. His public clinic soon became popular with patients, students and physicians, for with that immense territory to draw upon, the supply of rare and instructive cases was almost unlimited. Understanding the conditions, one could readily believe that he had seen and treated a larger number of laryngeal growths than any one in Europe.

In 1882 the University of Naples made him an instructor and, twenty years later, full professor of laryngology, meanwhile enabling him to develop a well equipped modern clinic.

Throughout his career Massei was an enthusiastic lover of his specialty, a devoted scientist, and an indefatigable worker, a practitioner of fine ability, a facile writer, and a brilliant teacher.

In 1880 he founded the Archivii Italiani di Laryngologia and continued its directorship as long as he lived. His contribution to the literature of laryngology, numbering more than 200, were scholarly, and in the light of his great clinical experience always valuable.

The popularity of his treatise on "Diseases of the Throat and Nose" was well attested by the fact that it was translated into three other languages.

Quick to recognize the value of worthy new methods, he was one of the first in Europe to employ intubation. This he did when superintendent of the Diphtheria Hospital. His services were freely sought generally in the other great hospitals of Naples and were always generously given.

An excellent linguist and a ready and eloquent speaker, he was in social life a most agreeable companion and in scientific discussions an always welcomed participant.

Bright and charming as to his personality and of a genius that was unique, his well spent years brought richly deserved honors and a measure of friendship as deep and genuine as it is indeed world wide.

## URBAN GILLESPIE HITCHCOCK, A.M., M.D.

Dr. Urban Gillespie Hitchcock died at his home in Poughkeepsie, New York, December, 1917. He was born at Wayne, Maine, February 24th, 1845, both parents having long been residents of his native State and of English extraction. They removed to New York City during the early childhood of the son, who was educated at the public schools. He graduated from the College of the City of New York in 1865, received the degree of A.M. in 1868 and that of M.D. from the College of Physicians and Surgeons in 1869. He then served the regular term of interneship at the New York City Charity Hospital and upon its close entered upon the practice of medicine in New York City.

He was appointed Clinical Assistant in the Throat Department of the College of Physicians and Surgeons in 1877, soon

after the time this department was established by Dr. Lefferts, and when, to it, in 1889 courses of practical teaching were added, he was made an instructor. This position he held for two years, retiring in 1891. He was physician to the throat department of the New York Dispensary from 1876 to 1880. In 1881, he was appointed Assistant Surgeon to the New York Eye and Ear Infirmary and eight years later became full surgeon.

He was a member of the County and State Societies of New York, of the New York Academy of Medicine and of the Congress of American Physicians and Surgeons. He became a Fellow of the American Laryngological Association in 1881. Failing health obliged him to retire after a membership of thirty years.

Genial and lovable as a companion, Dr. Hitchcock was possessed of much natural refinement and of a cultivated mind, richly stored by extensive and well selected reading. Modest and self sacrificing to a fault, he made for himself friends of his own superior kind, by whom he was appreciated and warmly loved. Unmarried, tho' not from choice, he well represented Robert Louis Stevenson's ideal of the highest example of devotion to others—an unselfish bachelor.

## EXECUTIVE SESSION MAY 28, 1917, AND MAY 29, 1917.

The Secretary reported that there were no Honorary, Corresponding or Emeritus Fellow to be elected.

Drs. Hubert Arrowsmith, Wm. B. Chamberlin, G. M. Coates, Stanton A. Friedberg and Joseph B. Greene were elected by ballot to Active Fellowship in the Association.

Dr. Henry L. Swain and Dr. Hill Hastings were appointed an Auditing Committee of Two.

Drs. Swain, Myles, Logan, Ingals and Delavan were appointed as Nominating Committee of Five.

The Nominating Committee reported that for the next year, which is the fortieth annual meeting, Dr. J. Solis Cohen be recommended for Honorary President. For the other directors Dr. Thomas H. Halsted, Dr. John E. Rhodes, Dr. D. Crosby Greene, Dr. Harmon Smith, Dr. J. Payson Clark, Dr. Joseph H. Bryan, Dr. Thomas Hubbard, Dr. Alexander MacCoy, Dr. Thomas R. French and Dr. Joseph L. Goodale.

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## SECRETARY'S REPORT.

The secretary begs leave to submit to the Association the following report:

Since the Thirty-eighth Annual Congress, held in Washington May 9, 1916, our membership has been diminished by the death of Doctors William E. Casselberry, Jacob H. Hartman, D. Braden Kyle and G. Hudson-Makuen, thus reducing our total Active Fellowship to 79, making it possible to elect 21 New Fellows to meet the limit of one hundred membership. We have added 5 Active Fellows bringing our membership up to 84.

We have also lost by death Doctor Ephraim Cutter, one of the founders of the Association, and whose name has appeared for years in the Transactions, amongst the Past Active Fellows.

An extract from the will of Doctor William E. Casselberry has been printed in the Transactions of 1916.

There were no deaths, so far as the secretary is aware, amongst the Honorary, Corresponding or Emeritus Fellows.

There were appointed to the Board of Governors of the American College of Surgeons, by the president, for the year ending 1917, Doctors Herbert S. Birkett, G. Hudson-Makuen and Harmon Smith.

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## REPORT OF COUNCIL MEETING.

The Annual Meeting of the Council of the American Laryngological Association was held Saturday evening, January 13, 1917, at the office of the Secretary, 44 West 49th Street, New York City. The members of the Council present were, Drs. Goodale, Hubbard, Clark, Bryan and Smith.

Previous to the meeting there convened with the Council Drs. Delavan, Coakley and Harris. Dr. Delavan, as was moved at the 38th Congress, presented the subject of the advisability of making the 40th Annual Meeting of the Association a jubilee to commemorate the achievement of the fellows of the Association, to dwell upon its history and to enable those living, who were among its founders, to be present at the celebrataion.

Dr. Coakley presented the legal aspects of the Casselberry bequest, which entails the expenditure of $116.19 inheritance tax, in accordance with the Illinois State Law.

During the convention of the Council it was moved that it be recommended to the Association, that the 40th Annual Meeting be made a jubilee and that Dr. Delavan be elected as chairman, to act with the incoming president and secretary of that year as a committee to take the matter of the celebration in hand.

It was further recommended by the Council that the secretary acknowledge the receipt of the legacy of Dr. Casselberry to the Association, to Mrs. Casselberry, and that he be authorized to pay the inheritance tax as directed by the attorney for the Association, Mr. Arthur Knox.

The dates of the Annual scientific meeting were selected to be Monday, Tuesday and Wednesday, May 28th, 29th and 30, 1917, at the Hotel Chelsea, Atlantic City, N. J.

The Council recommends to the Association for election to Emeritus Fellowship, Dr. Samuel Johnston.

To Active Fellowship, Drs. Hubert Arrowsmith of Brooklyn, W. B. Chamberlin of Cleveland, G. M. Coates of Philadelphia, Stanton A. Friedberg of Chicago and Joseph B. Green of Asheville.

The question of a symposium or address for the 39th Congress was turned over to the president, Dr. Goodale, with power to act in accordance with his judgment, such action to be communicated to the secretary at the earliest possible moment.

The resolution of Dr. Mayer, to wit:—"That a printed copy of each paper to be read at the Annual Meeting be sent to each member, at least a fortnight before the meeting, and that authors be permitted to read a synopsis only of their papers—one member may be requested to open the discussion and have as much time for that purpose as the reader of the paper," was referred to the next annual Association meeting for further discussion and elucidation.

The Council confirmed by vote the appointment by the president of Dr. Cornelius G. Coakley, to succeed Dr. Thomas J. Harris on the Committee of Teaching of Oto-Laryngology, owing to the resignation of Dr. Harris from said Committee from the American Laryngological Association.

Washington University Medical School of St. Louis was placed on the exchange list.

There being no further business before the Council, adjournment was moved and carried.

J. L. Goodale, M.D., *President*,
Harmon Smith, M.D., *Secretary*.

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## SECOND MEETING.

The Second Meeting of the Council was held Monday, May 28, 1917, at the Hotel Chelsea, Atlantic City, N. J., Dr. Goodale in the chair.

There were present Drs. Bryan, Halsted, Hubbard, MacCoy, Sluder and Smith. The Council granted the request of Dr. Lockard to be absent from the annual meetings.

The secretary was authorized to write all the delinquents concerning By-law VI, Art. VI, which reads, "That any Fellow who shall have failed to furnish a paper for 3 successive meetings or absented himself for 3 successive meetings, may, upon vote of the Council, be suspended from the Association." The violation of this by-law is more noticeable among the new than older members.

The Council submits the names of Dr. J. H. Bryan as Delegate and Dr. D. Bryson Delavan as Alternate for the next 3 years to the Congress of Physicians and Surgeons. Likewise, Drs. Ingersoll, Rhodes and Fetterolf to act as Governors upon the Board of the American College of Surgeons for the year 1918.

The Council requests that the Vanderbilt University Medical Department, the Mayo Foundation of Medical Education and Research, and the University of California be added to the Exchange List for the Transactions.

The Council recommends for appointment to the Council of National Defense, Drs. Richardson, Shurly and Mosher.

There being no further business the Council adjourned.

HARMON SMITH, M.D., *Secretary*.

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## TREASURER'S STATEMENT TO MAY 1, 1917.

*Receipts*

| | |
|---|---|
| Balance from old account | $1,211.89 |
| Dues collected | 1,170.00 |
| Sale of Transactions | 62.80 |
| Interest on deposits | 17.20 |
| | $2,461.89 |

*Expenses*

| | | |
|---|---|---|
| Stenographer, 1916 meeting | $100.00 | |
| Secretary's Office, June, '15 to May, '16. | 238.46 | |
| Secretary's Office, to May 1, 1917 | 307.27 | |
| Printing, postage, etc., Secretary | 133.25 | |
| Transactions, 38th annual meeting | 734.83 | |
| Wreath, Dr. Kyle's funeral | 15.00 | |
| Obituary Editor | 16.24 | |
| Treasurer's expenses | 5.54 | |
| Etchings and cuts | 8.42 | |
| Collecting checks | .20 | |
| | $1,559.21 | |
| By balance in bank | 902.68 | |
| | $2,461.89 | |

ASSETS OF THE ASSOCIATION.

*Invested*

| | | |
|---|---|---|
| DeRoaldes Prize Fund | $500.00 | |
| Accrued interest to Feb. 1, 1917 | 217.53 | |
| | | $717.53 |

*Current*

| | | |
|---|---|---|
| Unpaid dues | $60.00 | |
| Bank balance | 902.68 | |
| | | $962.68 |
| Total assets | | $1,679.21 |

Liabilities none.

Respectfully submitted,

J. Payson Clark, *Treasurer.*

Audited and approved, May 28th, 1917:

Henry L. Swain,
Hill Hastings, } *Auditing Committee.*

## EXECUTIVE SESSION.

Dr. Harmon Smith: On resolution offered by Dr. Mayer last year to wit:

"That a printed copy of each paper to be read at the Annual Meeting be sent to each member, at least a fortnight before the meeting, and that authors be permitted to read a synopsis only of their papers—one member may be requested to open the discussion and he may have as much time for that purpose as the reader of the paper."

I think this matter is infeasible particularly in this Association. The majority of members send in their titles a very short while before the time to send out the annual programme, and I believe it would be still more difficult to get a printed copy and send it to each of the fellows of the Association. It would necessitate such a burden upon those who write papers that a great many would refuse to write a paper in preference to sending out a copy to the members.

It was therefore moved and seconded that the matter be tabled.

Upon motion duly made by Dr. Mayer and seconded, it was

Resolved that the Secretary notify all members to whom copies of their discussions are sent that unless the corrections are returned within a month from the time they are received by them, they will be printed as correct, and the Secretary is empowered to act in accordance with this Resolution.

### *New Business*

Dr. Greenfield Sluder:

It seems apparent for some considerable time that there is difficulty in recruiting the membership. The men cannot keep in touch with the younger men as they begin their work, and it is difficult to follow what they are doing. It is, however, the very keen desire of all that the Association shall select the promising men. To this end I make a proposal that a candidates' nominating committee be formed whose duties it shall be to familiarize itself with the work of the younger

men of the country, and select suitable names to be brought before the Council for its consideration, the formation of that Committee to be at the discretion of the Chair. But I make the proposal that it consist of five, six, or seven men, one from each of the largest five, six or seven cities of the country.

It shall not be the purpose or desire of this Committee to in any degree usurp the privilege of the individuals of this membership in nominating candidates as they have always done, but merely to help in the general effort to discover desirable candidates.

### Discussion

Dr. E. Fletcher Ingals, Chicago: This motion seems to me to be unnecessary. I appreciate Dr. Sluder's desire to get hold of all the good men, but we don't need a Committee to hunt them up. We have eighty-three men hunting them up. We do not need to recruit the Society; we have difficulty in keeping it small enough. I think the doctor's viewpoint is wrong. The policy has been for the past thirty-nine years to take any men that stood out from the rest of the profession as men of peculiar value to the specialty, as men who would perhaps stand out throughout the world, and in following this policy the council have usually found that the election of three or four members a year was as much as was desirable; and while there have been times when some of us have thought the council was parsimonious in the distribution of the honor, I am inclined to think that the policy has been wise. I think that if we adhere to the policy that has been followed in the last twelve or thirteen years, we will be better off.

Dr. Harmon Smith, New York City: It is not so much the fact that we need a vast number of applicants as it is the difficulties in getting proper data concerning those who apply. From the gentlemen living in the cities where the applicant comes from is the source of greatest difficulty of getting accurate data to guide the council. All of us are fallible. Dr. Ingals will recall that some of those gentlemen whom he has proposed, he has had occasion to withdraw their names himself voluntarily, finding out he was wrong in his assumption of the candidates' qualifications. We have to go a little deeper into their character and the requirements necessary to make them eligible members of this Association. We not only

require scientific attainment, but gentlemanly attainment. Because of the objection raised on the part of some relative to a certain proposed fellow, we have each year to postpone their names until next council meeting. The Council would like to take any reasonable number. We don't propose to violate the principles of this organization, we don't propose to take them in because they produce a vast quantity of scientific material; more than this is necessary to become a welcome member of this Association.

In regard to the new members I would like to say that possibly they do feel a little hesitancy in presenting a paper before a body composed of older members. The Secretary is advised to write delinquents that they must meet with Article 6 in the By-Laws; that they must appear every three years and present a paper; otherwise they are subject to being called to account by the Council, or even suspended. If we had a Committee representing the various cities, where some active fellow could look into the work of the younger men and present it with a full knowledge of an investigation of that man, I think it would aid the Council materially in coming to a conclusion relative to proposed members for the Association.

Dr. Joseph H. Bryan, Washington: I think I was partly responsible for this. Having been a member of the council for a number of years, I feel that we are laboring under very great difficulty in getting the proper men to be brought before this Association. The council has made a number of mistakes as the report here to-day shows. The Secretary's report shows that there are a number of men taken into this Association, one of whom I am responsible for, who have fallen down, and paid no attention to the rules and regulations. They don't appreciate the honor conferred upon them. We feel that with the concerted action on the part of some men who interest themselves more directly than has been done in the past we will be able to get hold of some younger men doing good work which has not as yet impressed some of the men not only of their own city, but in other parts of the country. The greatest difficulty is to get the proper information in regard to the men. If we could have some Committee appointed which could go into the matter a little more thoroughly, we could get hold of more good men. The difficulty about this Association is that the work is done principally by the older men, and the youngsters coming in here do not appreciate the honor, and are not coming forward and assisting in carrying on the work.

Dr. Henry L. Swain, New Haven: Everybody's business is nobody's business. I think we all recognize the truth of this.

Any of us who have been upon the Council and acted upon the names presented knows how insufficient are the data given to us to work upon, and whereas Dr. Ingals and all of us are willing, ready, and glad to help, we cannot keep track of the men, for example, in San Francisco as well as Dr. Hastings or someone in that locality can. It is necessary to have some local knowledge of the men rather than to judge them solely out of a multitude of words printed.

Dr. D. Bryson Delavan, New York City: I am in thorough accord with the remarks of Dr. Bryan. A committee such as proposed can hardly do any harm and is likely to prove very valuable. The Council does not always succeed in securing the names of men who would make good candidates. On the other hand, under the present system, a desirable candidate who has antagonized some member of the Association may be prevented from being considered by the Council through the securing by his antagonist of a certain number of negative votes. Already this measure has worked serious injustice.

Some means should be taken to bring before the Council the names of the very best men from every quarter of the United States, which now is not the case, and unjust personal opposition should be carefully guarded against.

Dr. Emil Mayer, New York City: I should like to ask if we should not consider, in connection with this Committee, not only the new members, but also empower this Committee to get in touch with the newly elected members calling their attention to the fact of their taking a more active interest. I feel something should be said on behalf of the younger members; I think there may be some diffidence on their part. It may be some backwardness on their part of not appearing before the Association and if this Committee had this aditional power it would be of great value to the Association.

Dr. E. Fletcher Ingals, Chicago: I heartily sympathize with Dr. Bryan and with practically all that has been said about the desirability of knowing the men, and picking out the good men, but the thing that struck me most forcibly in the motion was the statement that we wanted a lot of recruits. It is not to be a draft system.

The following were appointed to act as a Recruiting Committee to investigate the status of all specialists in their respective localities and report to the Council yearly with a view to obtaining new members:

Drs. Sluder, Birkett, Bryan, Coolidge, Delavan, Hastings, Ingals, Ingersoll, Levy, Lynch, Swain, Wood.

## REPORT OF COMMITTEE ON CONTROL OF CANCER.

D. BRYSON DEVEVAN, M. D., CHAIRMAN

### *Notes on Recent Activities of the Society Services of the Executive Secretary*

Two of the most active members of our Board of Directors are serving with the Council of National Defense at Washington, D. C.; Dr. Franklin H. Martin as the medical member of the Advisory Commission of the Council and Dr. F. F. Simpson as Chief of the Medical Section of the Council.

At the urgent request of Dr. Simpson, the Executive Secretary, Mr. Curtis E. Lakeman, was detailed by vote of the Executive Committee for duty with the Medical Section of the Council of National Defense beginning Monday, April 9th.

In the meantime the usual routine work of the headquarters office has been continued, all inquiries answered and requests for literature filled, although owing to the fact that many of our most active workers have been engaged in war preparedness work, no special extension work is at present being carried on.

### *Publicity*

### *Lecture Outline No.* 1

A lecture syllabus has been authorized by the National Council of the Society, which includes the active professional members of the Board of Directors, for the use of qualified lecturers on the subject of cancer. This outline has been bound in a manner to facilitate the insertion of additional sheets and memoranda by the speaker. While it contains an elementary survey of the general subject appropriate to lay audiences, it nevertheless assumes a medical education on the part of the lecturer as a requisite for its most effective use. Approximately 750 of these lecture outlines have been distributed to men of standing who have requested them. A notice published in a recent issue of the Weekly Bulletin of the New York City Department of Health regarding this lecture syllabus has been the source of many requests for copies from health officers and social workers throughout the country.

### *Census Report*

A special report on cancer mortality in the U. S. Registration Area has recently been published by the Census Bureau at Washington. The preparation of this report was suggested by the American Society for the Control of Cancer and our statistical experts have been frequently consulted in its development. This report is without doubt the most complete and detailed compilation of cancer mortality statistics ever published by any government. Separate figures are given for 29 organs and parts of the body affected, making this information available for the first time, since the practice hitherto has been to publish cancer statistics only under the seven titles, Nos. 39-45 inclusive, of the International List of the Causes of Death.

### *Nurses' Pamphlet*

A special bulletin for the guidance of the nurse in recognizing cancer in its early and curable stages has been prepared by the Society. This pamphlet, called, "How the Public Health Nurse Can Help to Control Cancer," was sent with a special appeal to 1,600 nurses in the United States through the co-operation of the National organization for Public Health Nursing. Notices of this bulletin have been carried in many of the nurses' magazines and a great number of requests for copies received. Nearly 4,000 copies in all have been distributed.

### *Organization Circular*

A special circular, intended for the guidance of those who are organizing State and local committees of this Society and participating in the campaign for cancer education as active field workers, has been recently prepared and distributed.

### *Ladies' Home Journal*

Through the co-operation of Mr. Dudley Harmon, Manager of the Washington Bureau of the Ladies' Home Journal, the article on the work of this Society was published in the April number of the magazine. Already upward of

400 inquiries for information and advice, which are directly traceable to this tiny insertion have been received at the headquarters office. These inquiries come from all parts of the country and illustrate very strongly the need of our campaign of cancer education. Some of the inquiries indicate the greatest ignorance, while others show only a desire to obtain knowledge for the early recognition and treatment of cancer in order that the information may be passed on to others or to save those with whom the inquirers come in contact from the ravages of the disease.

### *In Course of Preparation*

A pamphlet which has for its object the education of the profession with regard to cancer is in preparation under the direction of Dr. R. B. Greenough.

At the same time, a pamphlet designed for popular distribution is being prepared, under the supervision of Dr. Francis Carter Wood.

At the request of Dr. Haven Emerson, Commissioner of Health of New York City, who wished to follow a suggestion in one of the publications of the Society, which described educational work among midwives in England, and to do something in the way of instructing the midwives of New York City, a draft of a circular has been submitted to the members of the Executive and Publication Committees of this Society for their criticism and suggestion. This draft was prepared by Dr. Thomas, Chief of the Division of Midwives of the Bureau of Child Hygiene.

### *Lecture Staff*

A volunteer lecture staff consisting of 131 physicians and surgeons throughout the country has been established with representatives in nearly every State. The Society stands ready, therefore, to suggest and furnish speakers on the subject of cancer to address professional or public meetings and is filling many engagement in this connection.

### *Lantern Slides*

The Society has in its possession a collection 92 lantern slides for the use of qualified lecturers to illustrate talks on cancer. Some of these slides are not recommended for lay audiences, but the set contains a series which forms the nucleus of a fairly comprehensive syllabus in itself and around which the lecturer can fit his talk.

### *War Footing of the Society*

The outbreak of the war has made necessary a certain readjustment of the activities of the Society, plans for which are to be considered at the next meeting of the Board of Directors to be held on June 4th, 1917.

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## REPORT OF PUBLICATION COMMITTEE

Dr. George E. Shambaugh, Chicago, Ill.: The question of securing a high-grade scientific journal devoted to Oto-Laryngology is one that has been under consideration by this society and by other special societies in this country for a number of years. Three or four years ago as chairman of this committee we succeeded in getting a petition for such a journal signed by over three hundred of the leading men in our field of work. This petition was sent to the trustees of the American Medical Association, asking them to give us such a journal. No definite action was taken by the trustees of the American Medical Association at that time, largely because the two journals which they had only recently established—the one devoted to internal medicine and the other to diseases of children—had not been running long enough to justify their starting another journal just at that time. I understand there is another reason why a special journal in regard to Oto-Laryngology should be established at this time. The growth of the sections of the A. M. A. has brought about a situation where in the interest of the general medical profession and in the interest of the journal of the A. M. A., it does not seem advisable to continue the publication of

all the papers read before the various sections in the journal. The policy which has been in vogue of publishing all papers read before the sections in the journal has not been to the advantage of the journal itself and has not been in the interest of the general medical profession. Many of these papers are so highly technical that the only group of men to whom they would be intelligible would be those who are devoting their time exclusively to the specialty. To have these papers published in a general medical journal is undoubtedly a mistake. Of course, in all the sections of the A. M. A. there are presented many papers which have a very distinct interest for men outside of any particular specialty—papers having interest for the general practitioner. These papers the editor would very gladly accept for publication in the journal. I understand that the A. M. A. proposes to continue the publishing of all the papers and the discussions in full in a separate volume as they have been doing heretofore.

In closing this report, I would make the following recommendations, *i.e.*, that this association appoint a committee of three which should confer with a similar committee which we hope may be appointed from the American Otological Society and the Triological Society—this joint committee to present the matter to the trustees of the A. M. A. and nominate, say, twelve men from the specialists of this country, as editors of the special journal. The trustees of the A. M. A. may then select of this list a suitable number of editors—perhaps six—to begin work on this special journal.

### Discussion

Dr. E. Fletcher Ingals, Chicago: I move that the society request that the American Medical Association establish a journal in Oto-Laryngology. Now, as the speaker has stated, we may be sure that this would be a high-class journal. It is something that we have needed very much since the journal that was published for several years was suspended. It has been taken up with the American Medical Association before, but they were not in a position to do what we wished, and the different societies were not in accord as to the best thing to do, but it seems to be that a request at this time would be desirable.

Dr. Greenfield Sluder, St. Louis, Mo.: It seems to me that Dr. Shambaugh has confounded two issues. One, a question for the establishment of a special journal, has been before the association for a number of years. We have heard that discussed from time to time. We now have two journals that have heretofore taken care of our material pretty well. The value of a journal is not in the quality of the paper, or the technic by which it is printed, but in the material contained. That is one issue, and I want to be very clearly understood that I raise no point concerning that. That is not the reason that I have asked the floor.

What I do mean to bring up for our consideration is the question contained in a letter recently circulated, at least to some extent, by the trustees of the American Medical Association, in which the complaint was made that the specialists took up too much space in the journal. The cost of printing and labor had increased, and if the price of the journal were to remain what it is, they would be unable to take care of the specialists, and they gave figures and percentages to prove that we were too much in evidence. I answered that letter, stating that I for one prized the possibilities of entering the American Medical Association journal from time to time; that I for one felt that I had no other object in appearing before the sections of the American Medical Association, except that it carried my paper before the general profession. I stated that for our special purposes we had a number of special societies and that practically all specialists, every decent man practicing the specialty has access to one of these societies. I explained that the Academy of Otology and Oto-Laryngology practically demands decency alone for membership, that there are a number of this membership also in that, that the membership of the American Laryngolical, Rhinological and Otological Society is very considerable, and that our special requirements seemed to me to be most adequately provided for. But we have no means, however, of reaching the general profession. As Dr. Shambaugh has put it, when a publication is submitted to the Journal of the American Medical Association it is returned very politely, unless it was read in the section A. M. A. They have no space and no desire to publish special papers otherwise.

I furthermore stated in this letter that it was frequently voiced in the general meetings, or you could read between the lines, that we as specialists were a more or less despised lot. Incidentally, however, we contribute our share, and we serve a large mass of the public, and that we had, I thought, a right to

be considered and to continue to possess the means of reaching the general practitioner. I subscribe for the Journal of the American Medical Association always because I want to know the other medical practitioner's work and I feel that many others feel the same way who are not laryngologists. I subscribe for the American Journal of Medical Sciences and the Johns Hopkins Bulletin for the same reason. I see no reason why the general men should not be interested in what we are doing, and I for one violently opposed the plan of separating us from the general men. I have brought this up deliberately and I desire to submit it to the serious consideration of the membership.

Dr. Harmon Smith, New York City: In addition to assuming somewhat the same relationship to this matter that Dr. Sluder has given voice to, I think secondly we should consider in view of the turbulent times now existing, and the general unrest not only in scientific affairs, but in all affairs abroad and those which we are likely to engage in shortly here, it is advisable to try to institute a journal that might fall down through inadequate representation or supply of scientific material? I think there is a laxity of progress in scientific things. You are probably not as much in touch with it as the secretary. It seems to me a postponement would be advisable now until things have become more settled and have resumed the natural course of events. I merely suggest this because in the next few years we are likely to be drawn more and more away from scientific writing, and if we are going to start a journal and because of lack of scientific support it fails to materialize, we would probably fail in any subsequent endeavor.

Dr. J. Gordon Wilson, Chicago, Ill.: There are two things before us which are quite distinct. One as to whether this is the psychological moment or not, and the other is that of establishing a journal.

In regard to the question of establishing a journal, there can be no two opinions in the matter. We ought to see a journal representative of the best in Oto-Laryngology established. We have the statement of Dr. Shambaugh which is very clear and I for one feel that we ought to back him in everything. We ought to go ahead with the thing; we will have to do it some time or another. With regard to Dr. Sluder's remarks relative to the American Medical Association, the point is that the American Medical Association is quite willing to do what it can, but there is a limit to everything.

I would, however, like to know if this is the psychological

moment to move in this matter. You know quite well that in England just now we cannot get material for the journals; but that does not affect the general principle that we ought to have a journal, and I for one hope most sincerely that we will keep the Committee in action so that when the time comes for this journal to be established, we can go ahead.

Dr. Hanau W. Loeb, St. Louis, Mo.: The members of this Association will probably recall that in the past five years this question has been agitated and discussed and each time I have favored the establishment of a new journal. I would consider myself recreant in my obligation to the profession if I opposed in any way the establishment of any new additional scientific force in laryngology.

As Dr. Sluder has mentioned, there are two very different questions before us. My feeling in the matter is as to whether it is better now, in view of the position the American Medical Association has taken, for us to insist upon the establishment of a journal. The American Medical Association Trustees' point of view is not the Association's point of view. Their's is to get rid of this mass of material, not by putting it in the scientific journals. This is not done in the "Archives of Pediatrics." The transactions of the Department of Medicine are certainly not published in the "Archives of Medicine." It is entirely a different matter. I would favor a resolution to the effect that the Trustees establish a journal as soon as feasible, and then also a resolution that the Trustees do not discontinue the publication of the Transactions in the Sections of the American Medical Association.

Dr. Shambaugh makes a very nice point relative to the papers being submitted. I happened to have had an interview with Dr. Simmons when he had all the Transactions of the Association ready and the type set and he did not know what to do in the matter. He said, "We are not going to publish it—we cannot do it." I said, "You publish other things about acne and other peculiar dermatological conditions" and he said, "That is of interest to the general practitioner." We had a symposium on sinus disease in the last section which was not alone of interest to specialists. There was not any more important set of papers than those papers on sinus disease.

Now I feel that we should not urge the establishment of a journal now, but that we should, as a body, urge the establishment of a new laryngological and otological journal at the feasible moment; secondly, a resolution to the effect that

the American Medical Association should continue the publication of the Transactions of the Section.

Dr. Emil Mayer, New York City: We ought to bear in mind the fact that if the Board of Trustees sees fit to establish a journal they will do so whether we say so or not. I think the thing for the American Laryngological Association to do is to put itself on record and say whether or not they would favor a high class special journal. I don't think we have any right as members of this Association to tell them what is to be done. I believe it is the duty of that very strong section of the American Medical Association to say what they require, and not this Association. I think that the American Medical Association should publish what goes on in their own section. I myself believe that there is room in this country for a very high-class journal and believe it should be done independently of the American Medical Association, or anything else, and I believe it can be very successfully done.

Dr. George Shambaugh, Chicago, Ill.: This motion by Dr. Ingals was simply intended to put us on record that we, as an Association, favored the establishment of such a journal by the Trustees of the American Medical Association.

Dr. Sluder confused two issues. The first one is whether we, as an Association, desire to have the American Medical Association publish a high-class journal in our special field. The second is the question regarding the publication of the papers read before the section of Laryngology in the Journal of the American Medical Association. I mentioned the latter in my report simply to make it clear that the two are in no sense vitally connected. My understanding is that the Trustees of the American Medical Association has already passed unfavorably on the question of continuing the present policy of publishing all the papers read before each section in the Journal, so it is not a question we need to go into at this time at all. The question which we are interested in is whether or not we approve of the recommendation that the American Medical Association create for us a new journal devoted to laryngology.

Dr. Hanau W. Loeb, St. Louis, Mo.: The last speaker has certainly brought the matter again to an issue where these two items must be differentiated. The passing of the resolution will immediately confirm the Trustees in their opinion that the Transactions should be elminated.

I think that it is within the function of this Society to

express themselves since the Trustees have probably sent to each member of the Society a statement of what they are doing. I hope Dr. Ingals will see some way of having this Association express itself without confusing the two issues. We may say that we are in favor of a new Journal but insisting that we rather sympathize with the Association to the effect that we are of the disposition to oppose the elimination of the Transactions.

Dr. E. Fletcher Ingals, Chicago, Ill.: I would like to move that this Committee nominate the twelve men from whom the Trustees can select a certain number of editors of the Journal in case it is established along the plan that the speaker suggested. I feel myself that we ought to have ideals and ought to stand upon them, and the question of a good journal regardless of other journals I think is one that all of us would feel at one about. We would all be in favor of a high-class journal and it seems to me that the plan which is outlined is likely to work best. It is necessary to have independent editors—editors who would receive or return anything that they think best, editors who would work for the scientific value of the Journal. I don't think that we need worry about what will be left out or put in, or about the profession, and if the Trustees have twelve men from whom they can select half a dozen, they will pick out men who will do good work. There is one thing which seems to me to be very important. It may not occur to others, and they may not at all agree with me if it does occur to them. We have in Dr. Simmons a man of peculiarly good judgment in selecting his helpers; he has managed the Journal of the American Medical Association wonderfully well; he is a man who manages the Journal as he thinks is best for the American Medical Association regardless of what other people think about it. You all know about the bitter fight made on him by Dr. Lydston because he did not receive some of Dr. Lydston's papers which he did not think should be published. The same sort of thing will come up in the Sections of the American Medical Association. There will be some men who will oppose the Trustees in what they consider absolutely necessary—limiting the amount of material put in. Some of us are extremely sore if our papers are not published. I served on the Board of Trustees for a number of years and I know what responsibilities they have to assume, and I know Dr. Simmons very well indeed. I think Dr. Simmons considers me one of his firmest friends, yet has refused several papers I have offered him. I think he was right about it. I would be very willing to leave the selection of

the material that should be published in the Journal of the American Medical Association to the editors or Trustees with Dr. Simmons' help. Dr. Simmons is no more sure of prolonged life than the rest of us; if he should die before this is accomplished, it would be an irreparable lost opportunity. It would be a great mistake if we do not go on with this matter at present, and let it work out as rapidly as possible. I hope the speaker's suggestion with reference to the nomination of these twelve men will be carried out by this Society. These twelve would be selected by the Committee.

Dr. Ingal's motion was seconded and carried.

Dr. E. Fletcher Ingals, Chicago, Ill.: Upon being asked to re-state his motion, Dr. Ingals stated that the motion was that we request the Trustees of the American Medical Association to establish a high-class Journal in Laryngology and Ootology.

In view of the death of Dr. Kyle the chair appointed Dr. Fetterolf to act on this Committee to serve in the place of Dr. Kyle.

Dr. Shambaugh asked if this Committee was authorized to confer with similar Committees of the other two Societies.

The Secretary stated that they were appointed to act in accordance with their judgment and that all these Committees are usually re-appointed.

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## REPORT OF THE ABSTRACT EDITOR.

I have the honor to report that the abstract of the Scientific Proceedings of the Thirty-eighth Annual Congress of this Association held at Washington, May 9, 1916, was mailed to the Printer on the 27th of June.

The galley proofs were received by me on the 5th of September and sent to thirty-eight Medical Journals on the 13th of that month.

Thanks are due our fellow member, Dr. H. W. Loeb who promptly printed and sent me the galley proofs for distribution.

There was no expense whatever to the Association.

EMIL MAYER,
*Abstract Editor.*

## REPORT OF THE COMMITTEE ON TEACHING OTO-LARYNGOLOGY.

### *Undergraduate Work*

We recommend that students of the Junior and Senior years for the degree of Doctor of Medicine be given 72 hours of work in oto-laryngology, partly didactic and the remainder clinical and laboratory work, but that the clinical and the laboratory work shall count only as half time. This is based on the proposition that for the junior and senior years, each student should have all told, 1,320 hours or 22 Majors of classroom work. A major consists of 60 hours of didactic or 120 hours of laboratory or clinical work. It is assumed that in all didactic work the student will spend from 2 to 3 hours in study upon the subject to each hour of lecture or recitation work. Clinical and laboratory work are counted as half time, because these are not associated with the study required by didactic exercises. This total of 22 majors may well be apportioned among the various departments as follows:

2 Mj. may be selected by the candidate from any Department that he chooses, but there must be a minimum of

2 Mj. in Pharmacy, Materia Medica, Therapeutics and Preventive Medicine:

1 Mj. in Pathology;

5½ Mj. in Medicine;

5½ Mj. in Surgery;

At least 3 Mj. in Obstetrics and Gynecology;

.8 Mj. in Ophthalmology;

1 Mj. in Skin and Venereal Diseases and

1.2 Mj. in Oto-Laryngology.

We recommend that half of the 1.2 Mj. required in oto-laryngology in these two years be devoted to recitation and laboratory work and that the remainder be occupied by clinical work in the dispensaries and hospitals which will accustom the student to the use of instruments and make him familiar

with the normal appearances of the regions to be studied and with as many of the diseases of these organs as practicable.

We believe that it is *not* the function of the Undergraduate School to make specialists; but that every student should be instructed in the fundamentals that will be needed by him in general practice.

### *Graduate Work*

For the specialist we would recommend a two years course in Graduate Work in some of the established Universities under the University Faculty of Medicine. Such work should be *preceded* either by two years as an Interne in a general hospital of medicine and surgery or by 5 or more years in general practice or a combination of both. The details of the two years of graduate work have not been fully thought out and it is a matter that must necessarily be taken up with the University officials.

Tentatively we would suggest that the first year be occupied by an Interneship in a special hospital for oto-laryngology in connection with a few hours of didactic work every week. We suggest that the second year should be spent in residence at the University in research and clinical work.

Some of the existing hospitals and various high-grade schools might be utilized for the first of these years, but the second year ought necessarily to be spent in the University that would confer the degree.

It is probable that most graduate work would be given in short courses and that only comparatively few men would finally come up for the degree. However, it would be very desirable if several Universities would standardize their requirements so that men might take their work in different places and finally get the degree, even if they had to spend 5 or more years in doing various parts of the work.

Before granting a degree, the University should require of the applicant a thorough technical and practical examination. A thesis giving the results of original research might also be demanded. Although the value of a thesis is a mooted point as an index of the candidates' qualifications, its preparation

appears to inculcate habits of thought and study that may be well worth while.

In a word we recommend that the student in a graduate school should be well grounded in general medicine and surgery before he begins a two years' course leading to a special degree in oto-laryngology; that the first of these two years should be given to an Interne service in a special hospital with a moderate amount of seminar or didactic instruction; and that the second year be devoted to research and clinical work in the University School.

We further recommend that courses in Universities be so arranged that men working for this special degree may be able to take the 24 months' special work consecutively or in periods of from three to six months each. We believe that this plan would induce the largest number to thoroughly qualify themselves, and would eventually furnish a class of the best trained specialists.

E. Fletcher Ingals,
C. G. Coakley,
Geo. L. Richards,
*Committee.*

Miscellaneous Business

Dr. Joseph Goodale, Boston, Mass.: The Chair would like to bring up the matter with regard to a plan suggested and so well presented last night by Dr. Johnston with reference to the subscription of a fund to be used by Dr. Birkett for the relief of suffering as seen abroad.

Dr. Samuel Johnston, Baltimore, Md.: In regard to this donation to our Allies in France I beg to offer the following motion, viz.: That the Association authorize the Treasurer to appropriate the sum of two hundred dollars to be sent to Dr. Birkett from the American Laryngological Association as American Allies, to be distributed for relief work in France among the wounded of the Allied troops as may seem most desirable in his opinion, and that the Treasurer be requested to make that levy upon the respective members.

There are a great many gentlemen here who would be glad to make a contribution, and if we limited the amount we should collect to those present others probably would feel that they are somewhat slighted, so that if the Society will appropriate that amount of two hundred dollars for this object, I believe it will simplify matters very much.

Dr. E. Fletcher Ingals, Chicago, Illinois: While I am fully in sympathy with this object, the proposed action is a bad way to get at it. We cannot appropriate money from the Treasury excepting for the legitimate use of the Association. It is all right for the treasurer to send out letters to the different members requesting them to give a certain amount but we have no legal right to appropriate one dollar from the Treasury outside of legitimate Association purposes. There is no money in the Treasury for the purpose of aiding anyone, however much their condition may appeal to our sympathies.

This point seemed well taken by the Chair and Dr. Johnston withdrew his motion.

Dr. J. Payson Clark, Boston, Mass.: I shall be very happy to receive subscriptions from the members to-day and will send out notices to all the members of the Society who are not here, or who do not feel prepared to give to-day, in regard to this matter. In talking with several of the members, it seems in view of the various calls upon us for all sorts of things in this war time, that a small subscription would be best, and the sum suggested was the amount from two to five dollars. An average of three dollars from the Association would give us about $250 which would be a very nice little amount for Dr. Birkett to use in any way he saw fit. The Treasurer will be very glad to receive any subscriptions to-day and to send out the notices to the members.

A motion was made and seconded that subscribers be asked to give at least $2.

The Chairman made the suggestion that it would perhaps simplify the work of the Treasurer, if the gentlemen would place their subscriptions in an envelope with their names recorded upon the envelope, and in that way inform the Treasurer to whom to send out the notices.

No. 3 Canadian General Hospital-McGill,
Army Post Office, No. 3,
Boulogne, France.

21st June, 1917.

Dr. J. L. Goodale,
258 Beacon Street,
Boston, Mas., U. S. A.

My dear Goodale:

I have just to-day received 1415.00 (fr) from Lyonnais, Paris, through the Old Colony Trust Co., Boston, which I

understand is a gift from the Fellows of the American Laryngological Association to the hospital under my command. Permit me to express to you, and through you to the Fellows on behalf of myself, my brother officers, Nursing Sisters, N. C. O.'s and men our warmest appreciation of this very kind and much appreciated gift. Words fail me to express how deeply grateful I am to you all for such a practical evidence of your interest and sympathy in the humane work which it is our privilege to undertake in this great War.

I have had the pleasure of meeting the members of one of the American Medical Units quite recently, and to my surprise, I found that the Commanding Officer was a former student of mine, who had entered the United States Army. It seems strange that the first meeting of the American Unit should be that of one of my former students; it would seem as if there were a true bond of friendship being cemented between these two Great Nations.

We are still very busy, but in spite of it all, we are keeping remarkedly well.

With kindest regards, and renewed thanks,

Believe me,

Yours very sincerely,

HERBERT S. BIRKETT.

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## EXECUTIVE SESSION

The following officers were elected for the ensuing year:

Dr. Thomas Halsted, President.

Dr. John E. Rhodes, First Vice-President.

Dr. D. Crosby Greene, Jr., Second Vice-President.

Dr. Joseph H. Bryan, Librarian.

Dr. J. Payson Clark, Treasurer.

Dr. Harmon Smith, Secretary.

Drs. Thomas Hubbard, Alexander MacCoy, Thomas R. French and Joseph L. Goodale, Councillors.

Dr. Joseph H. Goodale: The retiring officer wishes to express his appreciation and the pleasure which these three days have meant to him which will remain the most memorable in his life.

Dr. Ingals and Dr. Johnston were appointed by the President to escort the incoming President to the Chair.

Dr. Thomas Halsted, Syracuse: Gentlemen and Members of the American Laryngological Association: I certainly deem this the greatest honor that has come to me in my life. When I was elected a member of this Society I felt that my ambition up to that time had been satisfied. This, however, is an honor which I had not expected, but is very greatly appreciated. I hope that the next meeting, a year from now, if we are fortunate enough to meet at that time, will be as successful as the present one. If there is no further business, I declare the meeting adjourned.

## LIST OF FELLOWS, 1917

### *Active Fellows*

1917. Arrowsmith, H., 170 Clinton Street, Brooklyn, N. Y.
1915. Barnes, Harry Aldrich, 305 Beacon Street, Boston, Massachusetts.
1908. Barnhill, John F., 408 Penway Building, Indianapolis, Indiana.
1904. Berens, T. Passmore, 35 Park Avenue, New York.
1893. Birkett, Herbert S., 252 Mountain Street, Montreal.
1891. Bryan, Joseph H., 818 17th Street, Washington, D. C.
1913. Butler, Ralph, 1926 Chestnut Street, Philadelphia, Pa.
1915. Canfield, R. Bishop, Ann Arbor, Mich.
1889. Casselberry, William E., 15 E. Washington Street, Chicago, Ill.
1917. Chamberlin, Wm. B., Osborn Building, Cleveland, O.
1896. Chappell, Walter F., 7 East 55th Street, New York.
1897. Clark, J. Payson, 71 Marlborough Street, Boston, Mass.
1902. Coakley, Cornelius G., 53 West 56th St., New York.
1917. Coates, George M., 1736 Pine Street, Philadelphia, Pa.
1899. Cobb, Frederic C., 11 Marlborough Street, Boston, Mass.
1905. Coffin, Lewis A., 616 Madison Avenue, New York.
1903. Coffin, Rockwell A., 234 Clarendon Street, Boston, Massachusetts.
1893. Coolidge, Algernon, Jr., 613 Beacon Street, Boston, Massachusetts.
1913. Dabney, Virginius, 1633 Connecticut Avenue, Washington, D. C.
1881. Delavan, D. Bryson, 40 East 41st Street, New York.
1892. Farlow, John W., 127 Bay State Road, Boston, Mass.
1901. Freeman, Walter J., 1832 Spruce Street, Philadelphia, Pa.
1914. Fetterolf, George, 134 South 20th Street, Philadelphia, Pa.
1905. Freer, Otto T., 34 Washington Street, Chicago, Ill.
1879. French, Thomas R., 150 Joralemon Street, Brooklyn, New York.
1917. Friedberg, Stanton A., 104 South Michigan Blvd., Chicago, Ill.

1897. Frothingham, Richard, 616 Madison Ave., New York.
1909. Getchell, Albert C., 6 Linden Street, Worcester, Mass.
1913. Goldstein, Max A., 3858 Westminster Place, St. Louis, Missouri.
1898. Goodale, Joseph L., 258 Beacon Street, Boston, Mass.
1905. Grayson, Charles P., 262 South 16th Street, Philadelphia, Pa.
1906. Greene, D. Crosby, Jr., 483 Beacon Street, Boston, Mass.
1917. Greene, Joseph B., Asheville, N. C.
1905. Halsted, Thomas H., 831 University Block, Syracuse, New York.
1896. Hardie, T. Melville, 34 Washington Street, Chicago, Ill.
1903. Harris, Thomas J., 104 East 40th Street, New York.
1915. Hastings, Hill, 924 Trust & Savings Bldg., Los Angeles, California.
1888. Hinkel, F. Whitehill, 581 Delaware Avenue, Buffalo, New York.
1907. Holmes, Christian R., 8 East 8th Street, Cincinnati, O.
1893. Hope, George B., 159 West 72d Street, New York.
1895. Hopkins, Frederick E., 25 Harrison Avenue, Springfield, Mass.
1895. Hubbard, Thomas, 541 Nicholas Bldg., Toledo, O.
1878. Ingals, E. Fletcher, 104 S. Michigan Avenue, Chicago, Illinois.
1904. Ingersoll, John M., 1021 Prospect Avenue, Cleveland, Ohio.
1907. Jackson, Chevalier, Walnut and 17th Streets, Philadelphia, Pa.
1878. Johnston, Samuel, 204 West Monument Street, Baltimore, Md.
1894. Leland, George A., 354 Commonwealth Avenue, Boston, Massachusetts.
1914. Levy, Robert, Metropolitan Bldg., Denver, Col.
1911. Lockard, Lorenzo B., Metropolitan Bldg., Denver, Col.
1913. Loeb, Hanau W., 537 N. Grand Avenue, St. Louis, Mo.
1897. Logan, James E., 1208 Wyandotte Street, Kansas City, Missouri.
1888. Lowman, John H., 1807 Prospect Avenue S.E., Cleveland, O.
1915. Lynch, Robert Clyde, 634 Maison Blanche Bldg., New Orleans, La.
1896. MacCoy, Alexander W., 216 South 15th Street, Philadelphia, Pa.
1914. Mackenty, John E., 43 West 54th Street, New York.

1883. Mackenzie, John N., 605 Washington Place, Baltimore, Maryland.
1896. Mayer, Emil, 40 East 41st Street, New York.
1913. McKimmie, Oscar A. M., 1330 Massachusetts Avenue N.W., Washington, D. C.
1904. Mosher, Harris P., 828 Beacon Street, Boston, Mass.
1914. Munger, Carl E., 81 North Main Street, Waterbury, Connecticut.
1901. Myles, Robert C., 46 West 38th Street, New York.
1903. Packard, Francis R., 304 South 19th Street, Philadelphia, Pa.
1906. Pierce, Norval H., 31 Washington Street, Chicago, Ill.
1908. Randall, B. Alexander, 1717 Locust Street, Philadelphia, Pa.
1903. Renner, W. Scott, 341 Linwood Avenue, Buffalo, N. Y.
1897. Rhodes, John Edwin, People's Gas Building, Chicago, Illinois.
1884. Rice, Clarence C., 123 East 19th Street, New York.
1905. Richards, George L., 84 North Main Street, Fall River, Massachusetts.
1902. Richardson, Charles W., 1317 Connecticut Avenue, Washington, D. C.
1913. Roy, Dunbar, Grand Opera House, Atlanta, Ga.
1907. Shambaugh, George E., 122 S. Michigan Blvd., Chicago, Illinois.
1909. Shurly, Burt R., 32 Adams Avenue W., Detroit, Mich.
1909. Sluder, Greenfield, 3542 Washington Avenue, St. Louis, Missouri.
1908. Smith, Harmon, 44 West 49th Street, New York.
1911. Stout, George C., 1611 Walnut Street, Philadelphia, Pa.
1889. Swain, Henry L., Colonial Bldg., 191 Church Street, New Haven, Conn.
1903. Theisen, Clement F., 172 Washington Avenue, Albany, New York.
1892. Thrasher, Allen B., The Groton, 7th and Race Streets, Cincinnati, O.
1892. Wagner, Henry L., 518 Sutter Street, San Francisco, California.
1892. Watson, Arthur W., 126 South 18th Street, Philadelphia, Pa.
1908. Wilson, J. Gordon, 104 S. Michigan Avenue, Chicago, Illinois.
1906. Winslow, John R., The Latrobe, Charles and Reade Streets, Baltimore, Md.

1905. Wood, George B., 129 South 18th Street, Philadelphia, Pennsylvania.
1890. Wright, Jonathan, Windy Rock, Pleasant, N. Y.

*Honorary Fellows*

1915. Bosworth, Francke H., 41 Park Avenue, New York.
1910. Chiari, Ottokar, Bellariastrasse, 12, Vienna, Austria.
1914. Cohen, J. Solis, 2113 Chestnut Street, Philadelphia, Pa.
1914. Lastra, de la Sota Y., 7 Calle de Torqueros, Seville, Spain.
1914. Lefferts, George M., Katonah, N. Y.
1910. Moure, E. J., 25 Cours du Jardin Public, Bordeaux, France.
1914. Navratil, Emerich von, iv Rigyoten, Buda-Pest, Hungary.
1915. Roaldes, Arthur W. de., 45, 634 Maison Blanche Bldg., New Orleans, La.
1909. Semon, Sir Felix, Rignalls, Great Missenden, Bucks, England.
1914. Thomson, Sir St. Clair, 64 Wimpole Street, London W., England.

*Corresponding Fellows*

1880. Bruns, Paul von, Tubingen, Wurtemberg, Germany.
1901. Collier, Mayo, 145 Harley Street, Cavendish Square, London W., England.
1913. Denker, Alfred Martinsberg 11, Halle, Germany.
1893. Desvernine, C. M., Cuba 52, Havana, Cuba.
1913. Eicken, Carl von, Friedrichstrasse 14, Giessen, Germany.
1901. Grant, Dundas, 18 Cavendish Square, London W., England.
1902. Heymann, Paul, 60 Lutzowstrasse, Berlin W., Germany.
1908. Killian, Gustav, Lutzow Ufer 3, Berlin W. 10, Germany.
1892. Krause, H., San Remo, Italy.
1902. Lermoyez, Marcel, 20 Rue de la Boetie, Paris, France.
1897. Luc, H., 54 Rue de Varenne, Paris, France.
1903. McBride, P., 20 South Drive, Harrogate, England.
1896. Macdonald, Greville, 85 Harley Street, Cavendish Square, London W., England.
1894. MacIntyre, John, 179 Bath Street, Glasgow, Scotland.
1896. Mygind, Holger, 31 Havnegade, Copenhagen, Denmark.
1901. Natier, Marcel, 10 Rue de Ballechasse, Paris 7e, France.

1903. Onodi, A., o'Uetza, 12, Buda-Pest, Hungary.
1910. Rethi, Leopold, IX Garnisongasse 7, Vienna, Austria.
1894. Sajous, C. E., 2043 Walnut St., Philadelphia, Pa.
1896. Schmiegelow, Ernest, 18 Norregade, Copenhagen, Denmark.
1903. Tilley, Herbert, 72 Harley Street, Cavendish Square, London W., England.
1913. Turner, Logan, 27 Walker Street, Edinburgh, Scotland.
1901. Wingrave, Wyatt, 11 Devonshire Street, Portland Place, London W., England.
1894. Wolfenden, R. Norris, The Grange, Kent, England.

*Emeritus Fellows*

1914. Brown, J. Price, 28 College Street, Toronto, Can.
1914. De Blois, Thomas Amory, 48 Gloucester Street, Boston, Mass.
1912. Lincoln, William, 210 Lennox Bldg., Cleveland, O.
1914. Porter, William, While-away Lodge, Ocean Springs, Miss.
1914. Robinson, Beverly, 42 West 37th Street, New York.

## PAST OFFICERS

### *Presidents*

(Year of Election)

| | | | |
|---|---|---|---|
| 1879. | Louis Elsberg | 1898. | W. E. Casselberry |
| 1880. | J. Solis Cohen | 1899. | Samuel Johnston |
| 1881. | F. I. Knight | 1900. | H. L. Swain |
| 1882. | G. M. Lefferts | 1901. | J. W. Farlow |
| 1883. | F. H. Bosworth | 1902. | J. H. Bryan |
| 1884. | E. L. Shurly | 1903. | J. H. Hartman |
| 1885. | Harrison Allen | 1904. | C. C. Rice |
| 1886. | E. Fletcher Ingals | 1905. | J. W. Gleitsmann |
| 1887. | R. P. Lincoln | 1906. | A. W. de Roaldes |
| 1888. | E. C. Morgan | 1907. | H. S. Birkett |
| 1889. | J. N. Mackenzie | 1908. | A. Coolidge, Jr. |
| 1890. | W. C. Glasgow | 1909. | J. E. Logan |
| 1891. | S. W. Langmaid | 1910. | D. Braden Kyle |
| 1892. | M. J. Asch | 1911. | James E. Newcomb |
| 1893. | D. B. Delavan | 1913. | Thomas Hubbard |
| 1894. | J. O. Roe | 1914. | Alexander W. MacCoy |
| 1896. | C. H. Knight | 1915. | G. Hudson Makuen |
| 1897. | T. R. French | 1916. | Joseph L. Goodale |

### *Vice-Presidents*

| | | |
|---|---|---|
| 1879. | F. H. Davis | |
| 1880. | W. C. Glasgow | J. O. Roe |
| 1881. | E. L. Shurly | W. Porter |
| 1882. | C. Eeiler | E. F. Ingals |
| 1883. | S. W. Langmaid | S. Johnston |
| 1884. | J. H. Hartman | W. H. Daly |
| 1885. | H. A. Johnston | G. W. Major |
| 1886. | E. C. Morgan | J. N. Mackenzie |
| 1887. | J. N. Mackenzie | S. W. Langmaid |
| 1888. | W. C. Glasgow | C. E. Sajous |
| 1889. | E. Holden | C. E. Bean |
| 1890. | J. O. Roe | J. H. Hartman |
| 1891. | M. J. Asch | S. Johnston |
| 1892. | S. Johnston | J. C. Mulhall |
| 1893. | J. C. Mullhall | W. E. Casselberry |

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|---|---|---|
| 1894. | C. C. Rice | S. H. Chapman |
| 1895. | J. Wright | A. W. de Roaldes |
| 1896. | T. M. Murray | D. N. Rankin |
| 1897. | A. W. MacCoy | H. S. Birkett |
| 1898. | J. W. Farlow | F. W. Hinkel |
| 1899. | T. A. De Blois | M. R. Brown |
| 1900. | H. L. Wagner | A. A. Bliss |
| 1901. | J. W. Gleitsmann | D. Braden Kyle |
| 1902. | G. A. Leland | T. Melville Hardie |
| 1903. | J. H. Lowman | W. Peyre Porcher |
| 1904. | Thomas Hubbard | W. J. Freeman |
| 1905. | J. L. Goodale | C. W. Richardson |
| 1906. | G. H. Makuen | A. B. Thrasher |
| 1907. | J. P. Clark | J. E. Rhodes |
| 1908. | E. Mayer | F. R. Packard |
| 1909. | C. G. Coakley | H. P. Mosher |
| 1910. | Robert C. Myles | J. M. Ingersoll |
| 1911. | F. C. Cobb | B. R. Shurly |
| 1912. | A. W. Watson | W. Scott Renner |
| 1913. | F. E. Hopkins | George E. Shambaugh |
| 1914. | Clement F. Theisen | Lewis A. Coffin |
| 1915. | J. Gordon Wilson | Christian R. Holmes |
| 1916. | Thomas H. Halsted | Greenfield Sluder |

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| 1882. | D. B. Delavan | 1900. | J. E. Newcomb |
| 1889. | C. H. Knight | 1911. | Harmon Smith |

*Treasurer*

1912. J. Payson Clark

*Librarians*

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| 1879. | F. H. Bosworth | 1883. | T. R. French |
| | | 1903. | J. H. Bryan |

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*1883. Sir Morell Mackenzie, London, England
*1907. Leopold von Schroetter, Vienna, Austria
*1904. B. Fraenkel, Berlin, Germany
*1914. Clinton Wagner, New York
*1910. F. Massei, 4 Piazza Municipio, Naples, Italy.

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*1887. A. Gouguenheim, Paris, France
*1894. Edgar Holden, Newark, N. J.
*1881. Carlo Labus, Milan, Italy
*1880. Wilhelm Meyer, Copenhagen, Denmark
*1901. Moritz Schmidt, Frankfort-am-Main, Germany
*1881. Pugin Thornton, London, England
*1881. R. Voitolini, Breslau, Germany
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†1881. Sir Felix Semon, Bucks Co., England
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†1896. Ottokar Chiari, Vienna, Austria

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*1914. J. Price Brown, Toronto, Canada
*1914. Thomas Amory De Blois, Boston, Mass.
*1914. Joseph W. Gleitsmann, New York City
*1912. Charles H. Knight, New York City
*1914. Samuel W. Langmaid, Boston, Mass.
1912. William Lincoln, Cleveland, Ohio
1914. William Porter, Ocean Springs, Miss.
1913. Arthur W. de Roaldes, New Orleans, La.
1914. Beverly Robinson, New York City.

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*1878. Morris J. Asch, New York

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*1883. C. W. Chamberlain, Hartford, Conn.
*1882. S. Hartwell Chapman, New Haven, Conn.
‡1884. J. Solis Cohen, Philadelphia, Pa.
1880. E. W. Cushing, Boston, Mass.
*1878. Ephraim Cutter, West Falmouth, Mass.
*1880. W. H. Daly, Pittsburgh, Pa.
*1878. F. H. Davis, Chicago, Ill.
*1901. E. T. Dickerman, Chicago, Ill.
*1878. Frank Donaldson, Baltimore, Md.
*1878. William Carr Glasgow, St. Louis, Mo.
‡1879. Edgar Holden, Newark, N. J.
1882. Franklin H. Hooper, Boston, Mass.
1882. Frank L. Ives, New York City
*1878. Hosmer A. Johnson, Chicago, Ill.
*1879. Woolsey Johnson, New York City
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*1901. Gordon King, New Orleans, La.
*1885. Charles H. Knight, New York City
*1878. Rufus P. Lincoln, New York City
1881. G. W. Major, Montreal, Canada
1879. Charles McBurney, New York City
1885. H. Clinton McSherry, Baltimore, Md.
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*1880. D. N. Rankin, Allegheny, Pa.
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*1878. Jacob H. Hartman, Baltimore, Md.
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